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DEXAMETHASONE PROPOSAL

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Executive Summary:

The system is currently unable to obtain Methylprednisolone due to shortages and a switch needed if the system wants to maintain the availability of steroids for reactive airway disease and allergic reaction. This also presents opportunities such as cost savings, increased routes of administration, and simplification for providers. There are concerns with the vial being more similar to other medication vials already in the system and the fact that training will be necessary, however, continuing education assures us that training needs will be minimal.

OVERVIEW

Below is a summary of current steroid use in the system.

Methylprednisolone is currently used between 60-80 times per month, with use peaking in the months of October and November. The system currently has 105 vials remaining with no expected ship date for more medication. A nationwide shortage is due to manufacturing delays at Pfizer with no further reason given. Use has been increasing in the system over the past few months and the average use has been increasing steadily over the past two years.

The system currently transports 280-300 respiratory distress/allergic reaction calls per month according to primary impression, also peaking in the months of October and November.

Accounting for Methylprednisolone currently on ambulances, the system is expected to run out of methylprednisolone in the next 1.5-3 months.

Needs

There is a preference to maintain a safe steroid in the system for use in adult and pediatric patients experiencing reactive airway disease or allergic reactions.

- Need #1: Ensure patient safety
- Need #2: Ensure ease of provider use
- Need #3: Maintain adequate supply

The Opportunity

Three major operational advantages have been identified: versatility, cost savings, and simplification for providers.

- **Versatility**
    - Dexamethasone can be administered orally

- Dexamethasone is long acting, with a half-life of 36-72 hours, usually dosed once per day, rather than 3 times per day. This would allow ample time to arrange for longer-term medical management by integrated services if needed.

- **Cost Savings**
  - Dexamethasone costs $2.92 per vial whereas Methylprednisolone costs $11.00 per dose. Annualized for current used, Methylprednisolone costs $8,283.00 per year, while Dexamethasone at the same burn rate would cost $2198.76, a savings of over $6,000. While we anticipate increased usage due to increased versatility, this is anticipated at an average of 10 doses per month, so an increased cost of $20.92, coming to a total cost of 2,219.68, still a significant cost savings.
- **Simplification**
  - Dexamethasone can be administered orally in pediatric patients when no IV access is available and IM is undesirable due to patient condition/age. In studies on pain management, it has been shown that less invasive route availability leads to more pain management medication administration in pediatric patient populations as well as on female patients.

CLINICAL JUSTIFICATION

Adult patients who receive albuterol are currently administered methylprednisolone at over twice the rate as pediatric patients (28.1% vs. 13.3%). Studies have shown that the administration of steroids appears to shorten length of hospital stay in both respiratory and anaphylaxis patients. The addition of dexamethasone to the formulary, and thus the oral route to steroid administration may increase steroid administration in pediatric patients due to its non-invasive nature. Studies have shown that paramedics are more likely to administer medications to children through non-invasive means.

In a 2022 randomized control trial appearing in the Journal of Asthma, researchers looked at pediatric asthma patients who were treated with either Methylprednisolone, Hydrocortisone or Dexamethasone for acute severe asthma. They found no difference in the duration of beta-2 agonist continuous treatment, hospital and PICU length of stay, pediatric asthma severity score (PASS), B2 agonist maximum dose or need for ventilator support between all three groups.

Regarding allergic reaction and anaphylaxis, research is more limited, however there a small scale study that showed no significant difference in mortality from anaphylactic shock between patients that received Dexamethasone compared to Methylprednisolone.

RECOMMENDATIONS

Several solutions are available to the problem of the Methylprednisolone shortage

- Recommendation #1: Switch to Dexamethasone and roll out the new medication, discontinuing use of Methylprednisolone
- Recommendation #2: Temporarily halt steroid administration until methylprednisolone becomes available again
- Recommendation #3: Switch to Dexamethasone until Methylprednisolone is available, then switch back

EXECUTION STRATEGY

As with similar moves, the execution strategy is to ensure adequate supply and work with necessary stakeholders to ensure provider education, patient safety, and measurables are developed prior to implementation of any clinical change.

Supply

The supply chain is not concerning for Dexamethasone and EMS supply assures us that they can obtain needed amounts

Patient Safety

The patient safety coordinator states no further concerns than those mentioned above since no provider workflow changes will be necessary. The patient population treated will be the same as no contraindications exist that would change this and the "whole vial" is still drawn up.

Education

The EMS CE department will develop a just in time training with a quiz which will include a video with a Deputy Medical Director explaining the reasons for the change, the new medication, when, and how to utilize it. The video will also cover patient safety concerns such as "sounds like dextrose" and the fact that the vial may look like the Midazolam vials.

Measurables

Use and administration will be measured in KPIs in the two months following roll-out to ensure feedback and that there is not a drop-off in administration. Afterwards, it will be tracked using ESO Insights at 6 month and 12 month marks as is normal for all new medications in the system.

Thank you for your consideration,

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