



State of New Hampshire

Department of Safety

Division of Fire Standards and Training and Emergency Medical Services
Richard M. Flynn Fire Academy
98 Smokey Bear Blvd., Concord, New Hampshire
Mailing Address: 33 Hazen Drive, Concord, New Hampshire 03305-0002



John J. Barthelmes
Commissioner

Richard A. Mason
Director

MEMORANDUM

TO: NH EMS Providers
NH EMS Unit Leaders
NH EMS Medical Control Board
NH Licensed I/Cs

FROM: New Hampshire EMS Medical Control Board

RE: Protocol Change - dose of methylprednisolone

DATE: September 1, 2009

Protocol Change:

1. The NH EMS Medical Control Board changed Protocol 2.0 "Allergic Reaction/Anaphylaxis – Adult" and Protocol 2.1 "Asthma/COPD/RAD – Adult" in the current (2009 edition) of *The New Hampshire Patient Care Protocols*, at the 16 July 2009 meeting of the Board. The dose of methylprednisolone (Solu-Medrol®) is changed from 125 mg IV to 62.5 mg IV. There are no other changes.
2. This change was posted on our website on 21 July 2009 and became effective immediately. (www.nh.gov/safety/divisions/fstems/ems/advlifsup/documents/protocolchanges.pdf)

Background:

The essential reason for the dosage change was to protect children who are just slightly beyond the range of the length-based resuscitation tape ("Broselow® tape").

The Medical Control Board received reports of 2 children who exceeded the limits of the length-based resuscitation tape and had adverse reactions after they properly received the adult dose of 125mg of methylprednisolone. This was the correct procedure since Protocol 1.0 "Routine Patient Care Guidelines" states that a child who is longer than the length-based resuscitation tape is to be considered an adult for medical purposes.

One child who came to our attention through quality management staff at a larger hospital in NH received no steroids other than the prehospital dose and experienced significant and prolonged hyperglycemia. Although the child subsequently made a full recovery, harm did occur in that the hospitalization was prolonged for two days.

Longstanding Medical Control Board policy dictates that we make protection of children a high priority, and that we never lose sight of the doctrine of *Primum non nocere* – "first, do no harm". Therefore a reduction in the dose was approved to protect the large number of asthmatic children who are significantly smaller than adults yet over 145 cm in height or 36 kg in weight.

Fire Training – Certification – Fire Academy – Emergency Medical Services

Business: (603) 223-4200

Fax: (603) 271-1091

Toll Free: 1-800-371-4503

TDD Access: 1-800-735-2964

<http://www.nh.gov/safety/divisions/fstems>

One option might have been to change Protocol 1.0 and redefine “child”, but past experience has taught us that our present definition is practical, easy to understand, fast to use, and a strong backbone for our pediatric protocols.

We decided instead to reduce the adult dose. This effectively protects children from overdose, while providing a dose for adults that is generally recognized as effective.

Some providers have questioned how a “half” dose could be as good for asthmatic adults as a “full” dose.

The dosing of corticosteroids is different than that of most other drugs. Corticosteroids have a range of recommended dosage for various conditions in adults of over 300 fold. This is one of the broadest ranges of therapeutic dosing of any class of medication. While methylprednisolone 125 mg IV is a traditional dose for asthma and other conditions, neither the safest dose, nor the most effective dose, nor the minimal effective dose has ever been determined.

There is very little published research on optimal dosage of corticosteroids for respiratory conditions. What research does exist is inconsistent, but tends to show that the dose-response curve becomes flat. On the other hand certain classes of side effects – such as psychological abnormalities – seem to show a continually rising dose-response curve. In other words, higher doses of steroids are not more effective than moderate ones, but they may have more adverse reactions.

A national standard which the MCB uses as a basis for protocol is the 2007 NHLBI Asthma *Guidelines*.^{*} These guidelines recommend an adult dose of “40 - 80 mg/day in 1 or 2 divided doses”. The new protocol dose of 62.5 mg is well within this limit. The former protocol dose of 125 mg was above the NHLBI guideline, but was a traditional dose widely used in emergency departments, and was unlikely to harm most full-sized adults who do not have comorbid conditions (such as diabetes). There is no evidence that the higher dose is more effective.

New Hampshire providers, EMS educators, EMS administrators and EMS physicians who are interested in the role of corticosteroids in the prehospital setting may want to know that for the 2011 edition of the EMS Protocols the Medical Control Board is considering eliminating corticosteroids completely. We have found no credible literature that establishes a benefit for the use of steroids in the field. Input from the EMS community will be of critical importance in our decision on this important issue.



Douglas McVicar, MD, Chairman, for the Board.

^{*} National Heart Lung and Blood Institute. 2007.

Expert Panel Report 3: Guidelines for the Diagnosis and Management of Asthma - Full Report
<http://www.nhlbi.nih.gov/guidelines/asthma/index.htm>