



MEDICAL CONTROL BOARD

Michael Smith, MD, FACEP, Chair
St. John Medical Center

Chad Borin, DO, FACOEP, Vice Chair
St. Anthony Hospital

David Smith, MD, Secretary
Baptist Medical Center

Roxie Albrecht, MD, FACS
OU Medical Center – Trauma

Russell Anderson, DO
Hillcrest Hospital South

Mark Blubaugh, DO, FACOEP
OSU Medical Center

Brandon Boke, MD
OU Medical Center

Barrett Bradt, MD
St. Francis Hospital

Jeffrey Dixon, MD, FACEP
Hillcrest Medical Center

John Nalagan, MD, FACEP
Mercy Health Center

Keri Smith, DO
Integris Southwest Hospital

OFFICE OF THE MEDICAL DIRECTOR

David Howerton, NRP
Director of Clinical Affairs –
Western Division

Duffy McAnallen, NRP
Director of Clinical Affairs –
Eastern Division

Matt Cox, NRP
Director of Critical Care Analytics

Jennifer Jones
Executive Assistant

Jamil Rahman
Director of Health Information Systems

Curtis Knoles, MD, FAAP
Assistant Medical Director

Jeffrey M. Goodloe, MD, NRP, FACEP, FAEMS
Medical Director

July 18, 2018

To: All Fire Chiefs, EMSA President, and AMR Directors

From: Jeffrey M. Goodloe, MD, NRP, FACEP, FAEMS
Medical Director

Re: Environmental Temperature Control for Medications and Intravenous Fluids

Based upon review of the Physicians Desk Reference (PDR) and/or medication insert information sheets, the following temperature-related guideline should serve as a goal in medication and intravenous fluid handling and storing within your respective organization:

Unless otherwise directed for specific medications or specific intravenous fluids, medications and intravenous fluids should be kept within controlled temperatures between 59 and 86 degrees Fahrenheit whenever logistically possible and reasonable.

I quickly realize that the practice of EMS Medicine is conducted under mobile conditions not analogous to hospital-based medical practice. Unfortunately, the inherent chemical nature of the medications common to both medical practices does not promote them retaining full potency when exposed to temperature extremes for repeated, prolonged times.

Given the realities of design of and space availability on emergency apparatus, emergency calls dictating rapid responses, and always challenging public safety budgets, I am not aware of any single, practical solution that avoids medications and intravenous fluids being exposed to *any* temperature extremes in EMS systems within the US. That said, there are a number of proactive, effective practices that EMS systems, including ours, can routinely utilize towards achieving the identified goal.

The purpose of this communication is *not* to prescribe any specific remedy, as different organizations have and will continue to identify solutions that fit their stations, deployment models, apparatus, and personnel best. Rather, the purpose of this communication is to thank you for your attention to this ongoing challenge and to encourage you to continue to work with leaders within your EMS services to continually factor both hot and cold weather patterns in Oklahoma, working sincerely to limit the frequency and duration that medications and intravenous fluids are exposed to temperatures outside the manufacturer recommended ranges.

If you have any further questions or comments, please do not hesitate to contact me or any member within the Office of the Medical Director.



ATTACHMENT – Table of Temperature Goals by Medication/Intravenous Fluid
 Recommended Exposure Temperature for Medications and Intravenous Fluids, Manufacturer:

Medication	Stability Statement [Ref. PDR and/or Insert Stability Statement]
Activated Charcoal	59 - 86 degrees F
Adenosine (Adenocard)	59 - 86 degrees F. Do not refrigerate as crystallization may occur. If crystallization has occurred, dissolve crystals by warming to room temperature. The solution must be clear at the time of use.
Albuterol	36 - 77 degrees F
Amiodarone (Corderone)	59 - 86 degrees F. Protect from excessive light.
Aspirin	59 – 86 degrees F
Atropine Sulfate (including in Duo-Dote)	59 - 86 degrees F
Calcium Chloride	59 – 86 degrees F
Calcium Gluconate	59 – 86 degrees F
Dextrose	59 - 86 degrees F. Caramelization and discoloration can occur with heat extremes. Discard if discolored.
Diazepam (Valium)	59 - 86 degrees F
Diltiazem (Cardizem)	Store under refrigeration (36 – 46 degrees F) Do Not Freeze
Diphenhydramine (Benadryl)	59 - 86 degrees F
Dopamine	77 degrees F. Reported stable up to 130 degrees F. Solution will darken from colorless to a dark yellow or amber brown as it decomposes and should be discarded if discolored. Protect from freezing.
DuoDote Auto-Injector	59 – 86 degrees F
Epinephrine (including autoinjectors)	59 - 86 degrees F. Should be protected from light.
Etomidate (Amidate)	68 – 77 degrees F
Fentanyl	68 – 77 degrees F
Glucagon (including its dilution solution)	59-86 degrees F
Glucose (Oral)	59 – 86 degrees F
Glucose Test Strips	40 – 86 degrees F
Haloperidol (Haldol)	68 – 77 degrees F
Hydroxocobalamin (CyanoKit)	59 – 86 degrees F. Stable up to 6 hours after reconstitution at temperatures not exceeding 104 degrees F
Ipratropium (Atrovent)	59 - 86 degrees F. Avoid excessive humidity.
Lidocaine (Xylocaine)	59 - 86 degrees F
Lidocaine Viscous Gel	68 – 77 degrees F
Magnesium Sulfate	68 - 77 degrees F
Methylprednisolone (Solu-Medrol)	59 - 86 degrees F
Midazolam (Versed)	59 – 86 degrees F
Morphine Sulfate	59 - 86 degrees F
Naloxone (Narcan)	59 - 86 degrees F
Neosynephrine Spray, (Afrin)	59 - 86 degrees F
Nitroglycerin	59 - 86 degrees F
Norepinephrine (Levophed)	59 – 86 degrees F
Normal Saline	77 degrees F
Ondansetron (Zofran)	68 – 77 degrees F
Phenylephrine 2% (NeoSynephrine)	68 – 77 degrees F
Pralidoxime Chloride (2PAMCl) autoinjector (including in Duo-Dote)	59 - 86 degrees F
Sodium Bicarbonate	59 - 86 degrees F
Tranexamic Acid	59 – 86 degrees F