

# ISMP Perspectives on Standardization of Syringe Labels and Vial Colors

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# ISMP National Medication Errors Reporting Program



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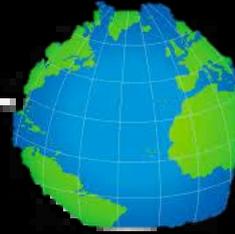
## A Safer World by Preventing Medication Errors

For over 30 years, ISMP has been a global leader in patient safety as the first non-profit organization dedicated to the collaborative development, education, and advocacy of safe medication practices.

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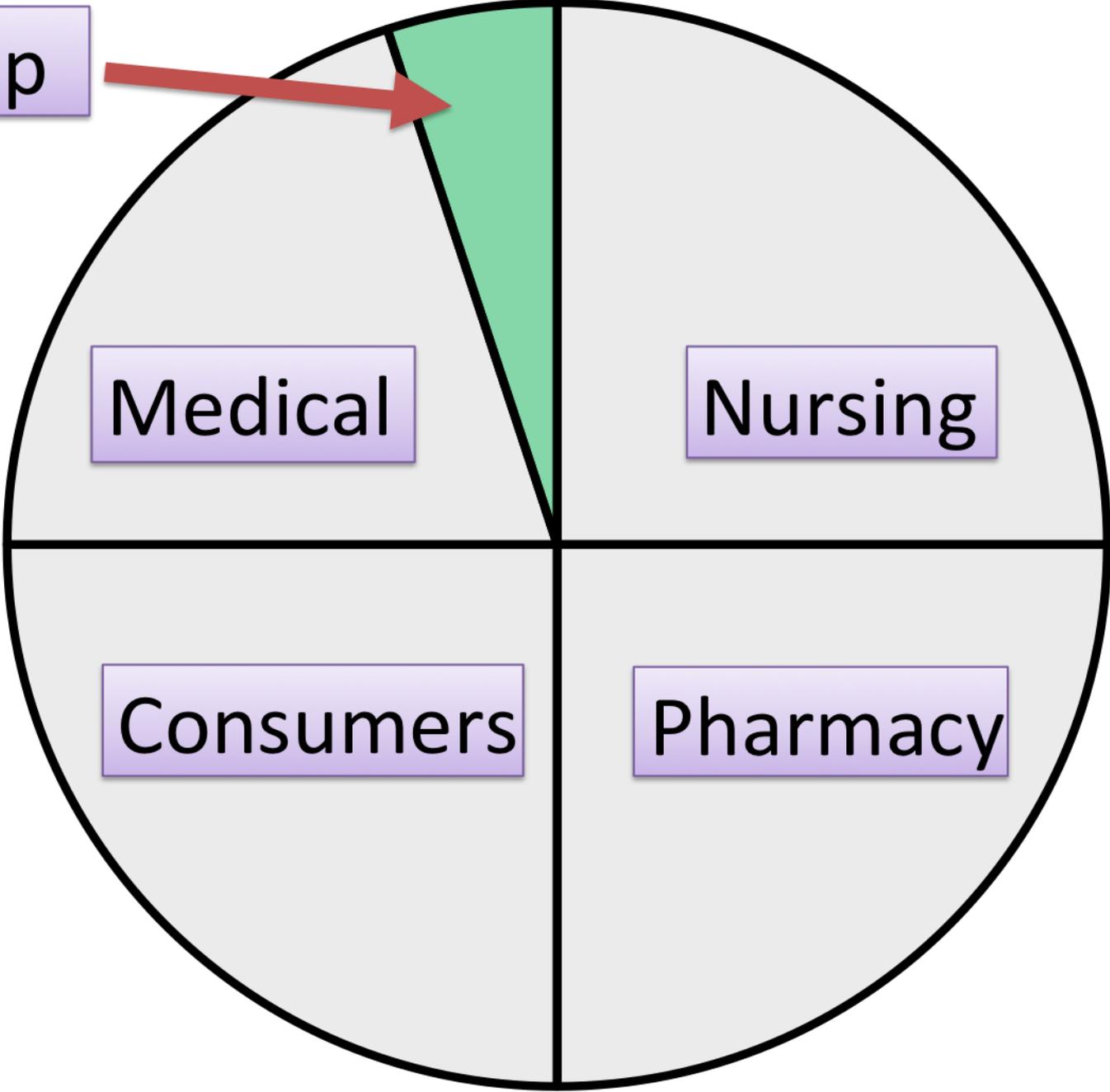
[www.ismp.org](http://www.ismp.org)



World



Peri-op



# #1

Expression of drug  
concentrations on vials  
and prefilled syringe  
labels

# USP <7> standard: 3 Rules

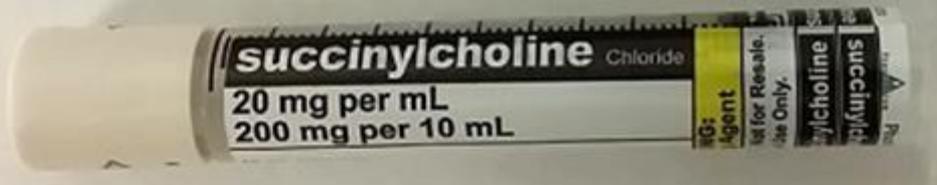
1. For containers < 1 mL: 12.5 mg/0.625 mL
2. For containers = 1 mL: 5 mg/mL (not 5 mg/1 mL)
3. For containers > 1 mL:

500 mg/10 mL  
(50 mg/mL)

25,000 Units/5 mL  
(5,000 Units/mL)

USP and FDA require this format  
for all US injectables in vials





**Ketamine HCl**  
**10 mg/mL**  
in 0.9% Sodium Chloride  
5 mL in 5 mL Syringe (50 mg)  
**INJECTION FOR IV USE**  
Each mL contains: Ketamine HCl 10 mg



**Ketamine HCl**  
**10 mg/mL**

in 0.9% Sodium Chloride  
5 mL in 5 mL Syringe (50 mg)  
**INJECTION FOR IV USE**

Each mL contains: Ketamine HCl 10 mg  
and Benzethonium Chloride 0.02 mg in  
Sodium Chloride solution for Injection

**QuVa™**  
Pharma  
1075 West Park One Drive,  
Suite 100  
Sugar Land, TX 77478  
877-296-0190

STORE AT CONTROLLED ROOM TEMPERATURE

**CIII**

**THIS IS A COMPOUNDED DRUG**

For Institutional or Office  
Use Only—Not for Resale  
Federal Law Prohibits  
Dispensing without  
Prescription



Date Compounded:  
00119 05/11/2018

Exp: 08/09/2018

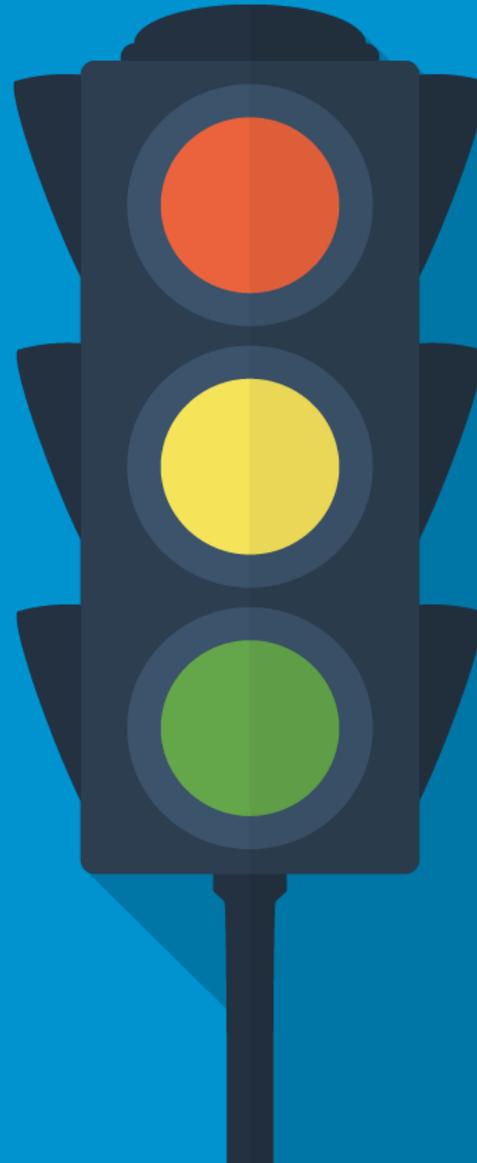
Lot: 10010635

To Report SUSPECTED ADVERSE  
REACTIONS, contact QuVa Pharma  
at 877-296-0190, or FDA at  
[www.FDA.gov/medwatch](http://www.FDA.gov/medwatch) or  
1-800-FDA-1088.

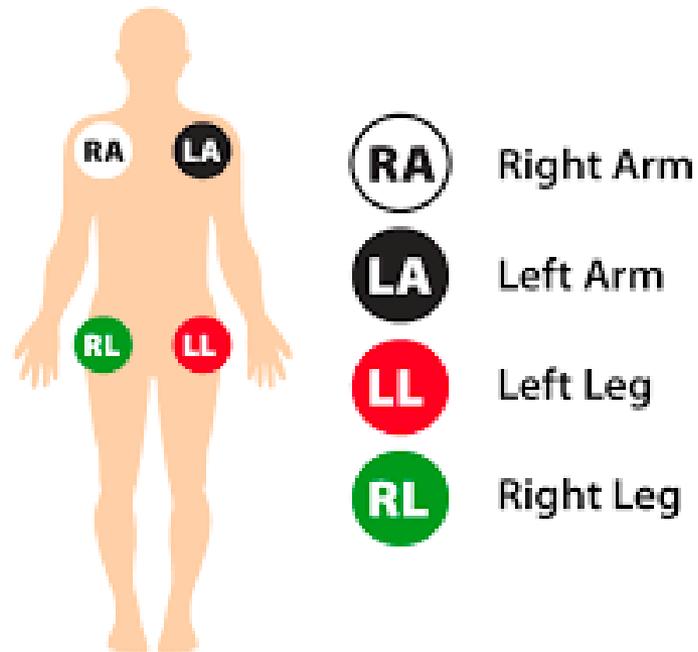
#2

# Color-Coding

# Colors Promote Safety



# Colors Can Promote Standardization



# Colors Associate with Good Feelings...



# ...and Bad Feelings



DRUG CLASS <sup>A</sup>	EXAMPLES	PANTONE COLOR (unearned)	LABEL EXAMPLES
1	Induction Agents	YELLOW	PROPOfol _____ mg/mL Date _____ Time _____ Int _____
2	Benzodiazepines	ORANGE 151	MIDAZolam _____ mg/mL Date _____ Time _____ Int _____
3	Benzodiazepine Receptor Antagonist	ORANGE 151 AND WHITE DIAGONAL STRIPES	FLUMAZenil _____ mg/mL Date _____ Time _____ Int _____
4a	Muscle Relaxants (Depolarizer)	FLUORESCENT RED 805	SUCCINYLcholine _____ mg/mL Date _____ Time _____ Int _____
4b	(Non-Depolarizer]	FLUORESCENT RED 805	ROCURonium _____ mg/mL Date _____ Time _____ Int _____
5	Relaxant Antagonist (Non-Depolarizer)	FLUORESCENT RED 805 AND WHITE DIAGONAL STRIPES	NEOStigmine _____ mg/mL Date _____ Time _____ Int _____
6	Narcotics	BLUE 297	FENTanyl _____ mcg/mL Date _____ Time _____ Int _____
7	Narcotic Antagonists	BLUE 297 AND WHITE DIAGONAL STRIPES	NARcan _____ mg/mL Date _____ Time _____ Int _____
8	Major Tranquillizers	SALMON 156	DROperidol _____ mg/mL Date _____ Time _____ Int _____
9a	Vasopressors	VIOLET 256	EPHEDrine _____ mg/mL Date _____ Time _____ Int _____
9b	Vasopressors	VIOLET 256	EPINEPHrine _____ mcg/mL Date _____ Time _____ Int _____
10	Hypotensive Agents	VIOLET 256 AND WHITE DIAGONAL STRIPES	NITROGlycerine _____ mg/mL Date _____ Time _____ Int _____
11	Local Anesthetics	GRAY 401	LIDOcaine _____ mg/mL Date _____ Time _____ Int _____
12	Anticholinergic Agents	GREEN 367	GLYCOpyrrolate _____ mg/mL Date _____ Time _____ Int _____
13	Beta Blockers	COPPER 876U	LABETalol _____ mg/mL Date _____ Time _____ Int _____

# ASTM

# Should anesthesia syringe labels be color-coded?

**Self-prepared**



# Should anesthesia syringe labels be color-coded?



## In-house Pharmacy



# Should anesthesia syringe labels be color-coded?



**503b  
Outsourcer**



# Should anesthesia syringe labels be color-coded?

## Manufacturer



Normal

Propofol

.....mg ml<sup>-1</sup>.

Vecuronium

.....mg ml<sup>-1</sup>.

Morphine

.....mg ml<sup>-1</sup>.

Ephedrine

.....mg ml<sup>-1</sup>.

Atropine

.....µg ml<sup>-1</sup>.

Ondansetron

.....mg ml<sup>-1</sup>.

Diazepam

.....mg ml<sup>-1</sup>.

Lidocaine

.....%.

Neostigmine

.....µg ml<sup>-1</sup>.

Naloxone

.....µg ml<sup>-1</sup>.

Labetalol

.....mg ml<sup>-1</sup>.

Deuteranope

Propofol

.....mg ml<sup>-1</sup>.

Vecuronium

.....mg ml<sup>-1</sup>.

Morphine

.....mg ml<sup>-1</sup>.

Ephedrine

.....mg ml<sup>-1</sup>.

Atropine

.....µg ml<sup>-1</sup>.

Ondansetron

.....mg ml<sup>-1</sup>.

Diazepam

.....mg ml<sup>-1</sup>.

Lidocaine

.....%.

Neostigmine

.....µg ml<sup>-1</sup>.

Naloxone

.....µg ml<sup>-1</sup>.

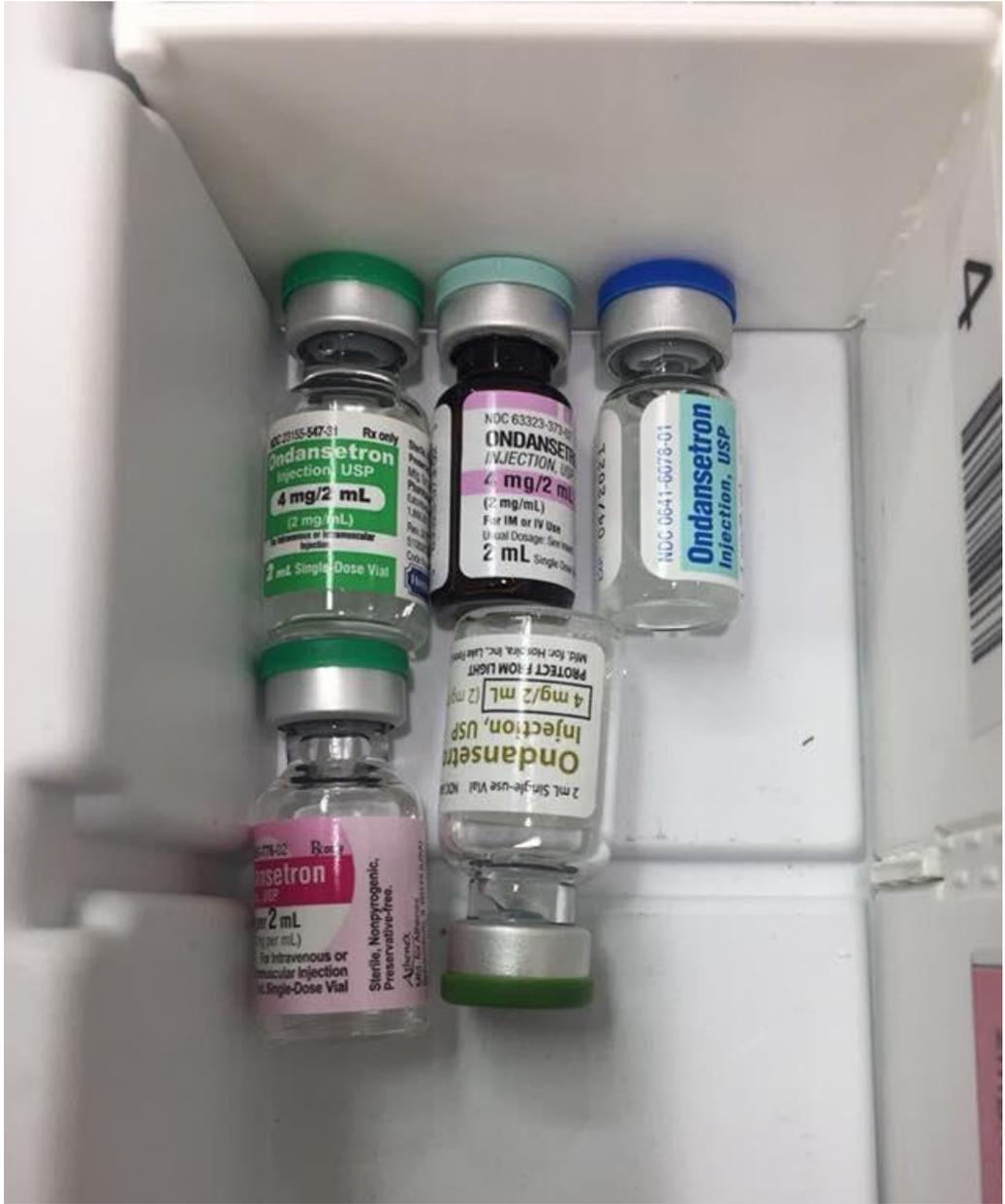
Labetalol

.....mg ml<sup>-1</sup>.

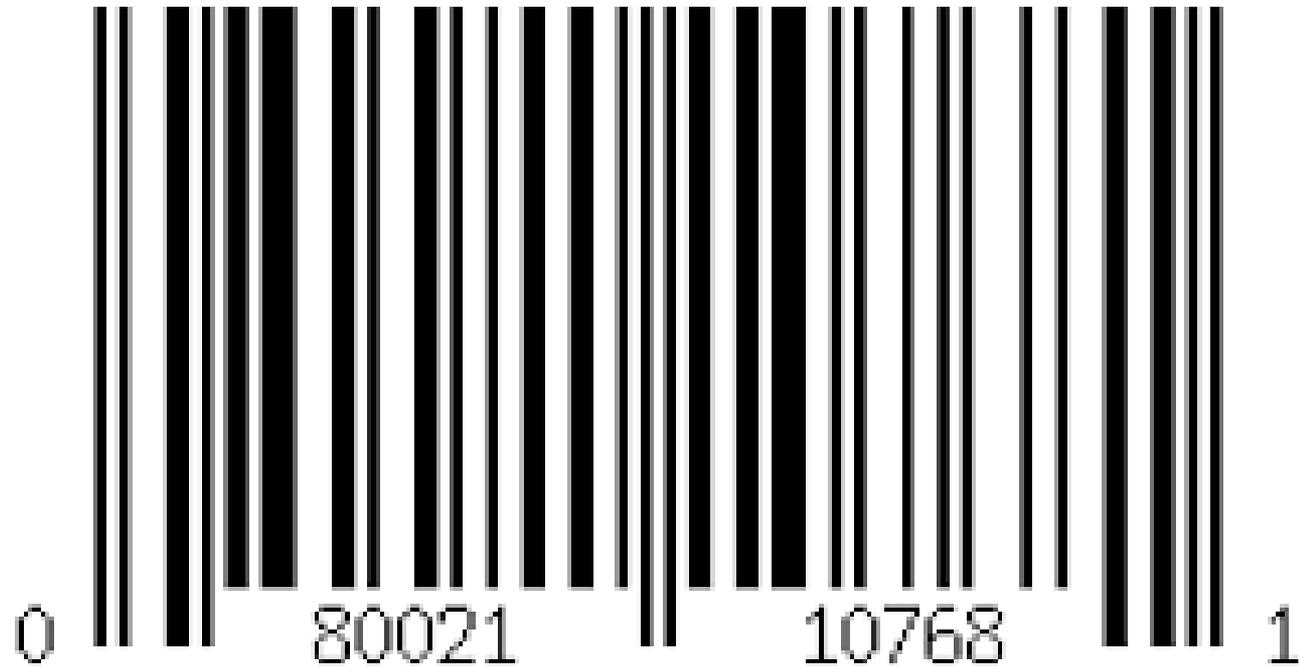
# Color blindness

Thomas, Mollon,  
BJA, In press, 2018





# What's Better than Color-Coding?







**WARNING!  
PATIENT ALLERGIC  
TO MORPHINE**



#3

# Other forms of Unsafe Labeling



# PF-Succinylcholine

Rx Only

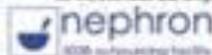
Chloride Injection, USP  
NDC: 69374-919-10 200mg/10mL (20mg/mL)

**WARNING: PARALYTIC AGENT**

Each 1mL contains:  
Succinylcholine Chloride Dihydrate,  
USP 20mg (as anhydrous);  
Sodium Chloride, USP 5mg;  
In Water for Injection, USP q.s.;  
pH adjustment: HCl/NaOH

EXP:  
LOT:  
Compounded:

Store: 20°C - 25°C. Protect from Light  
Hospital/Office Use Only  
This is a compounded drug  
for intravenous use only.



100% outsourcing facility  
4900 12th St, Extension  
West Columbia, SC 29172  
1-844-224-2225  
Not for resale

Adverse Event Reporting  
[www.fda.gov/medwatch](http://www.fda.gov/medwatch) or 1-800-FDA-1088  
CIC2014 Rev 12-29-17

PF-Succinylcholine



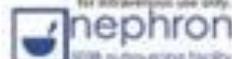
# Phenylephrine HCl

Rx Only

Injection, USP **Warning: Contains Sulfites**  
NDC: 69374-957-10 1mg/10mL (100mcg/mL)

Each 1mL contains:  
Phenylephrine HCl, USP 1mg;  
Sodium Chloride, USP 5mg;  
Sodium Citrate Dihydrate, USP 0.05mg;  
Citric acid Monohydrate, USP 0.05mg;  
Sodium Metabisulfite, 10% 0.02mg;  
In Water for Injection, USP q.s.;  
pH adjustment: HCl/NaOH

Store: 20°C - 25°C. Protect from Light  
Hospital/Office Use Only  
This is a compounded drug  
for intravenous use only.



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[www.fda.gov/medwatch](http://www.fda.gov/medwatch) or 1-800-FDA-1088  
CIC2014 Rev 12-29-17

EXP:  
LOT:  
Compounded:



Phenylephrine HCl

**Beware of different concentrations!**





# ISMP Conclusions

1. Labels should conform to USP 7: show total dose per entire syringe first
2. Color coding is not reliable or feasible, especially outside the OR
3. Bar-coding is the most feasible solution now

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