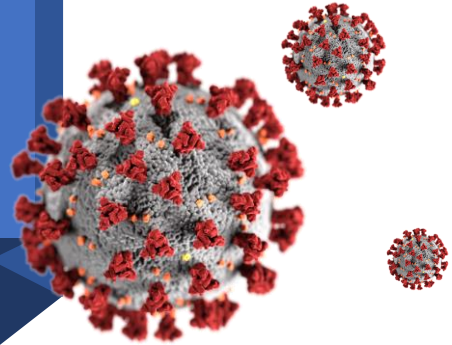


Learn. Heal. **Save.**  
Maddie's Shelter Medicine Program

# NAVIGATING ANESTHETIC DRUG SHORTAGES AFTER COVID-19



Maddie's  
Fund  
#ThanksToMaddie



Sheilah Robertson  
Senior Medical Director  
Lap of Love Veterinary Hospice  
Courtesy Professor University of Florida

1

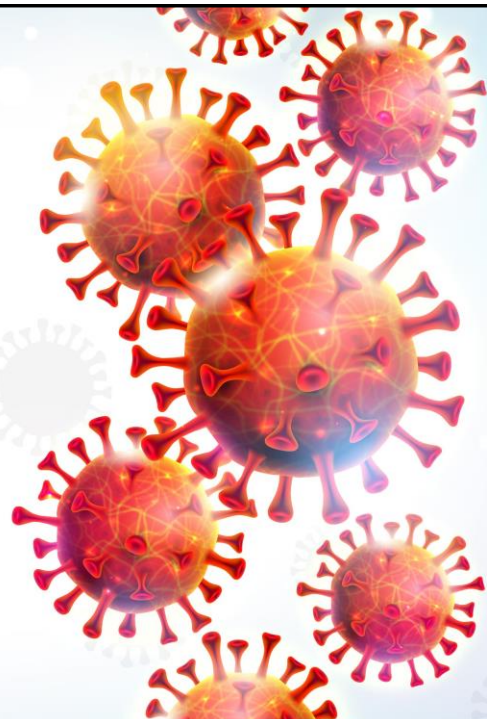
## DISCUSSION POINTS

Demand and supply

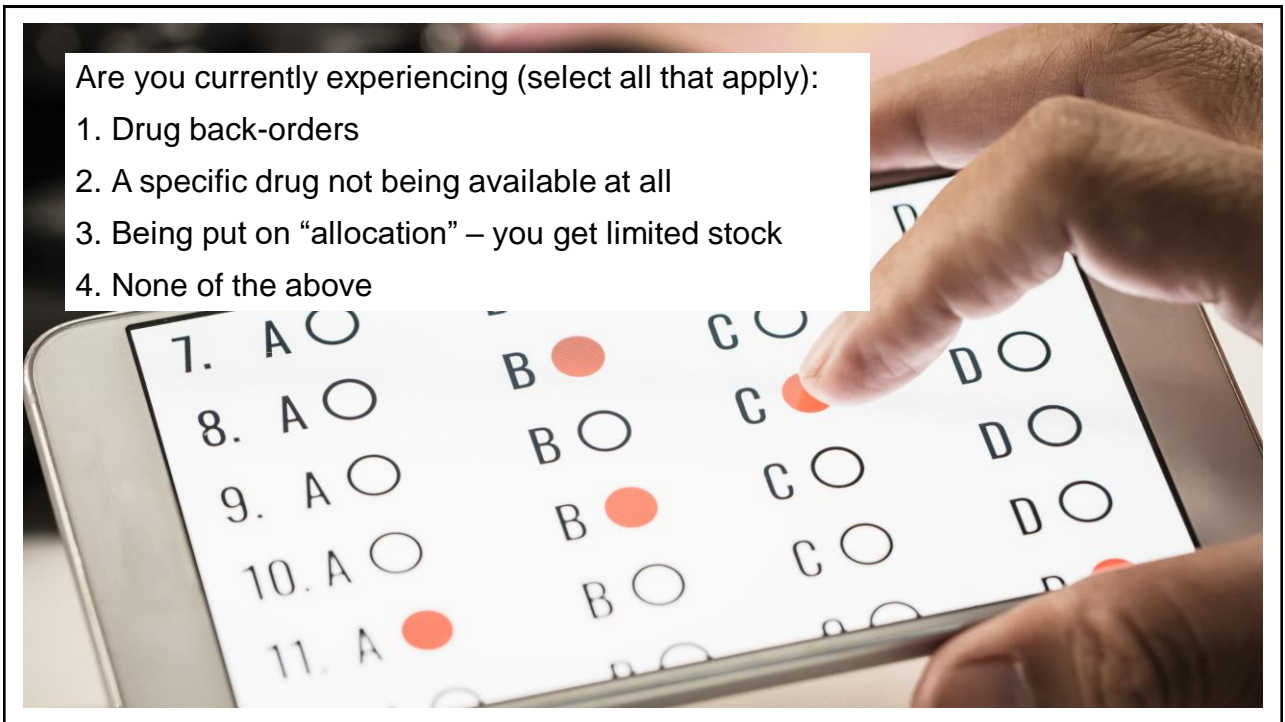
Global supply chain

Which drugs may be  
affected?

Solutions



2



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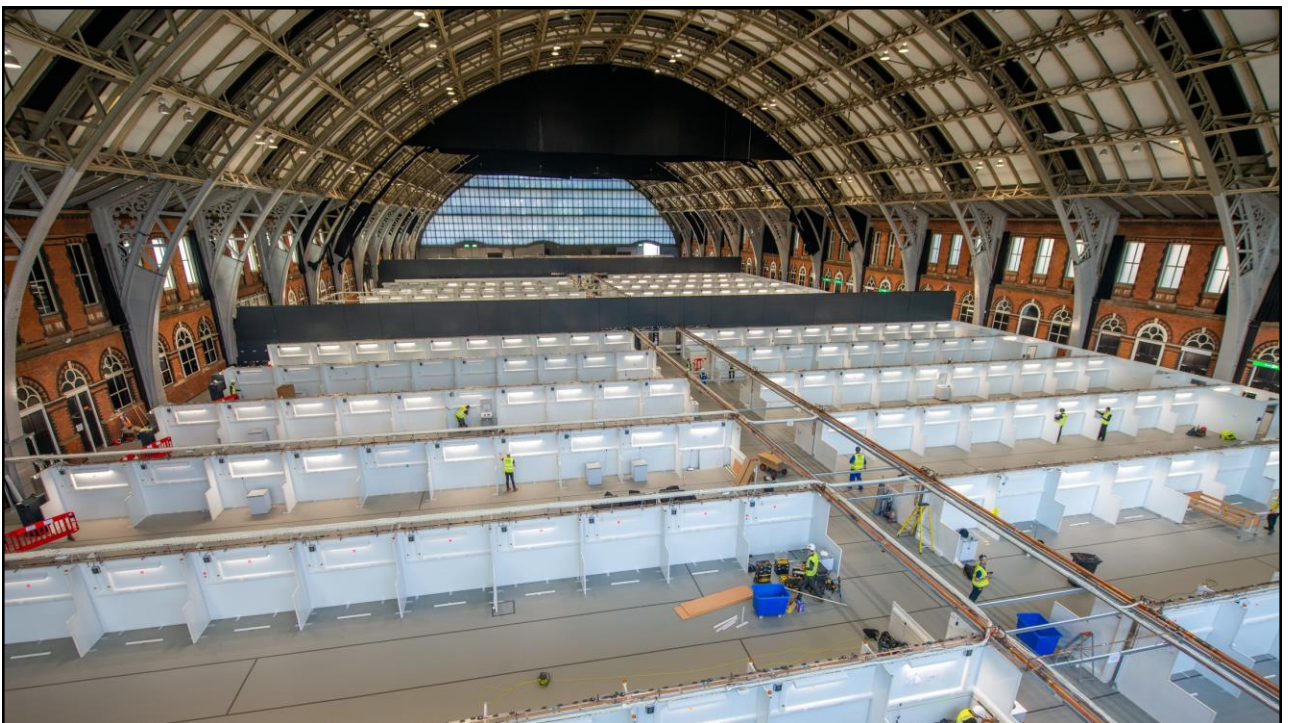
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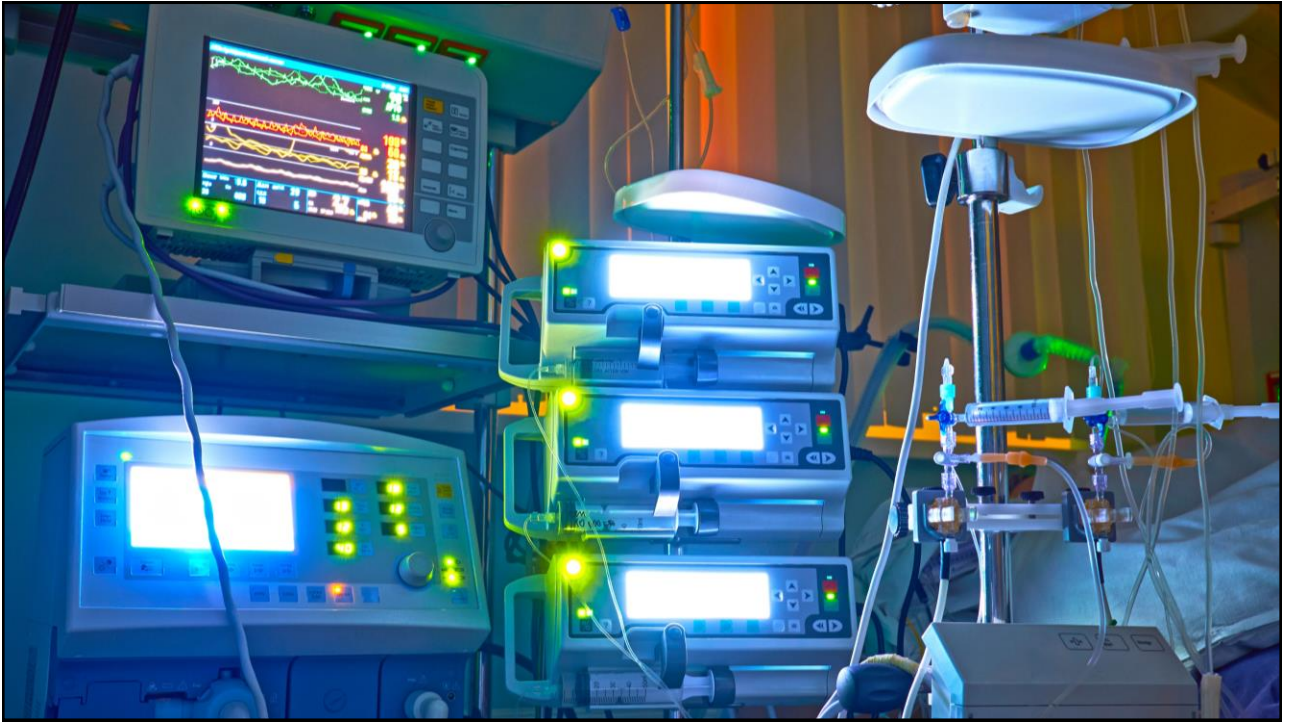
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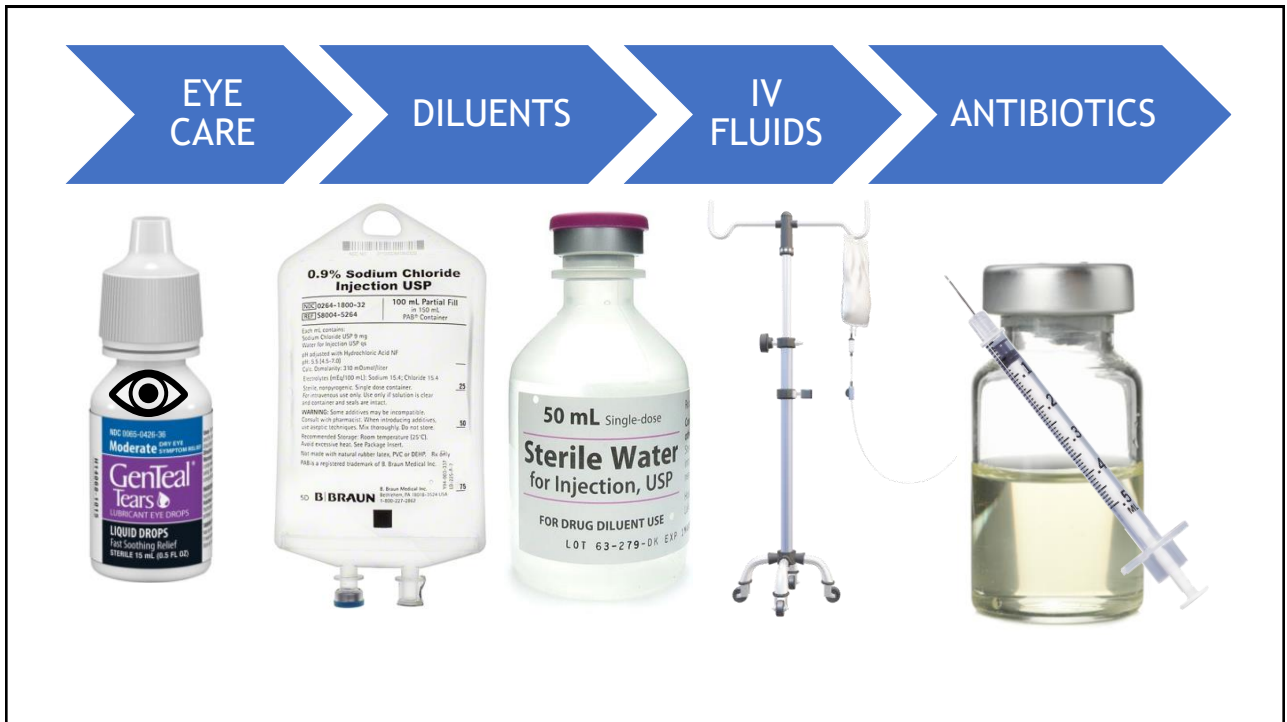
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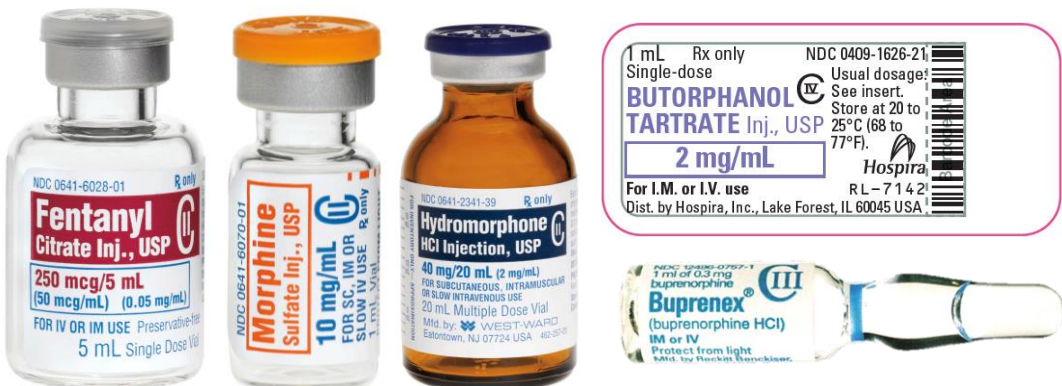
14

## Drugs used in humans and animals



15

## Analgesic drugs prescribed by DVMs and MDs



16



## Demand & Supply - March 2020

DRUG	INCREASE DEMAND NEW YORK %
Albuterol	1870
Fentanyl	533
Midazolam	4100
Propofol	123
Norepinephrine	53



17



As demand surged, 50% of prescriptions went unfilled

18



19

On average, how many pounds of bamboo does one adult Giant Panda eat each day?

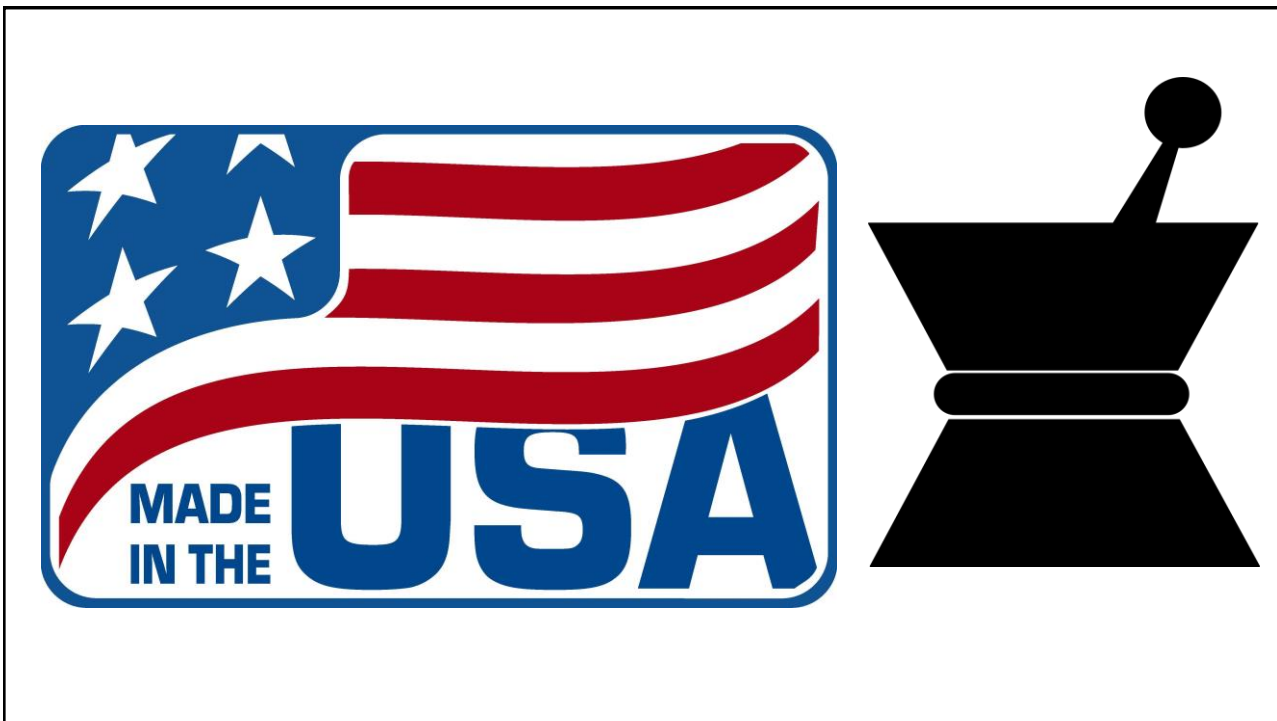
- A. 40
- B. 80
- C. 100
- D. 75



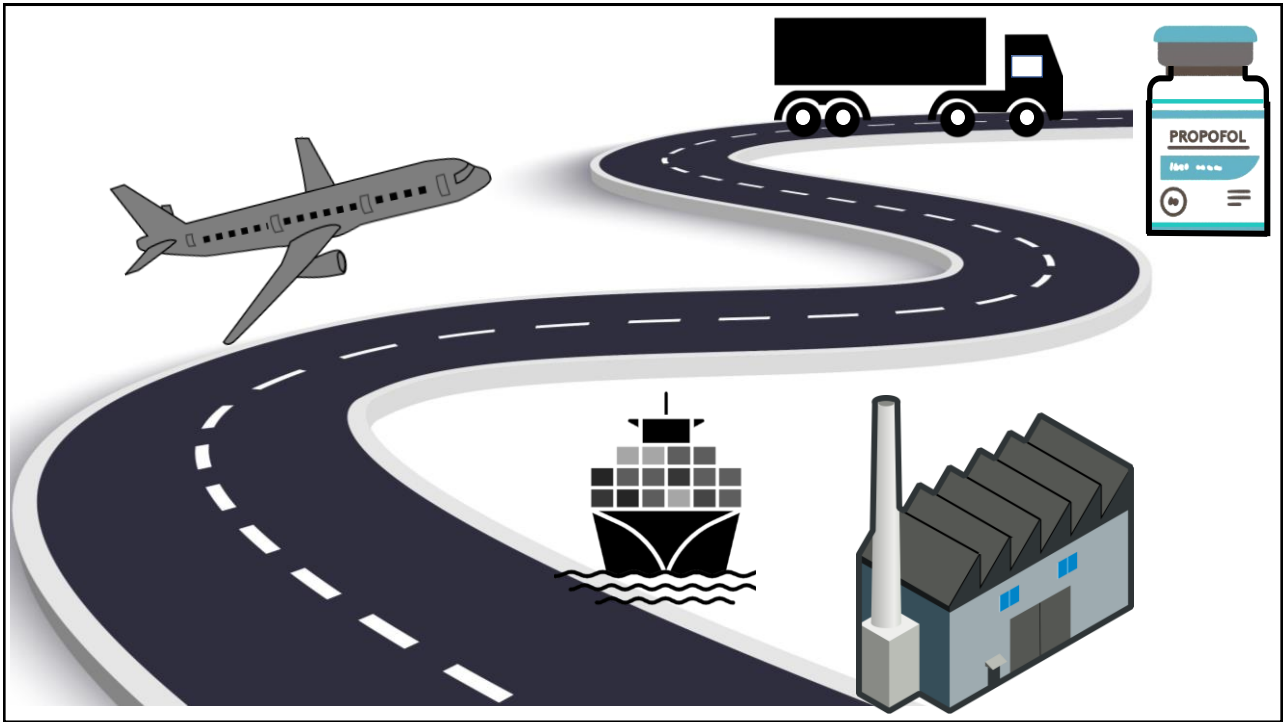
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21



22



23

## COVID-19 AND DRUG SHORTAGES

Coronavirus Disease (COVID-19): The FDA continues to take steps to monitor the supply chain. The Drug Shortage Staff within the FDA's Center for Drug Evaluation and Research (CDER) has asked manufacturers to evaluate their entire supply chain, including active pharmaceutical ingredients, finished dose forms, and any components that may be impacted in any area of the supply chain due to the COVID-19 outbreak. For the latest information from the FDA on COVID-19 see our website at: [Coronavirus Disease 2019 \(COVID-19\)](#).

To report a drug shortage please contact the CDER Drug Shortage Staff at: [DRUGSHORTAGES@fda.hhs.gov](mailto:DRUGSHORTAGES@fda.hhs.gov)



**SCAN ME**

[www.fda.gov/drugs/drug-safety-and-availability/drug-shortages](http://www.fda.gov/drugs/drug-safety-and-availability/drug-shortages)

24

08-12-2020

**Ketamine Injection****Status:** Currently in Shortage

Hikma Pharmaceuticals USA, Inc. (formerly West-Ward)

Presentation	Availability and Estimated Shortage Duration	Related Information	Shortage Reason (per FDASIA)
50 mg/mL, 10 mL vial (NDC 0143-9508-10)	Inventory is currently available.	Additional lots are scheduled to be manufactured. Product will be made available as it is released.	Demand increase for the drug
100 mg/mL, 5 mL vial (NDC 0143-9509-10)	This presentation is temporarily on backorder.	Additional lots are scheduled to be manufactured in the July - August 2020 timeframe. Product will be made available as it is released.	



25

## Interventions to mitigate potential shortages

# 4

Ramping up production

Extending “use by dates”

Increasing importation quotas

Temporary policy for compounding of certain drugs

26

**STATE OF EMERGENCY**  
**OPIOID CRISIS**  
 SEARCHING FOR SOLUTIONS

**DEA Proposed Significant and Ongoing Cuts to Production of Specific Opioids in 2017 [20-25%]**

***HYDROMORPHONE, MORPHINE, FENTANYL***

**Imposed quotas are being relaxed**



27

FDA is alerting health professionals of products that may be used beyond their labeled expiration date

**Search List of Extended Use Dates**

Search:



[www.fda.gov/drugs/drug-shortages/search-list-extended-use-dates-assist-drug-shortages](http://www.fda.gov/drugs/drug-shortages/search-list-extended-use-dates-assist-drug-shortages)



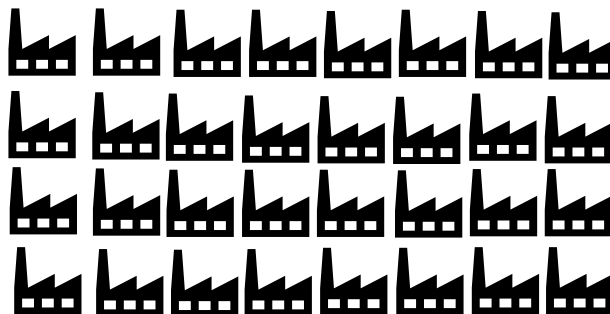
28



Product	Company	NDC Number	Lot Number	Expiration Date (Labeled)	Extended Use Date
Midazolam Injection, 10 mg/2 mL (5 mg/mL) vial	Pfizer	0409-2308-02	91172DK	1-Jul-2020	1-Jul-2021
Midazolam Injection, 10 mg/2 mL (5 mg/mL) vial	Pfizer	0409-2308-02	96182DK	1-Dec-2020	1-Dec-2021
Lidocaine HCl Injection 1%, 200 mg/20 mL (10 mg/mL) vial, individual	Pfizer	0409-4276-16	84097DK	1-Dec-2019	1-Jun-2020

29

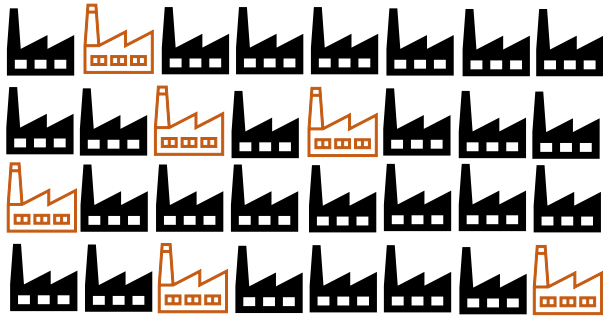
32 animal drug companies make drugs or source active pharmaceutical ingredients in China for the U.S. market



30



20% indicated they see supply chain disruptions that could soon lead to shortages



31

Updated May 22<sup>nd</sup> 2020

**AVMA**  
Our Passion. Our Profession.

**SCAN ME**

COVID-19: Drug and medical supply impacts

ON BACKORDER:

Antibiotics

Alprazolam tablets

Ophthalmic Preparations

Famotidine injection

[www.avma.org/resources-tools/animal-health-and-welfare/covid-19/covid-19-drug-medical-supply-impacts](http://www.avma.org/resources-tools/animal-health-and-welfare/covid-19/covid-19-drug-medical-supply-impacts)

32





Compounding FAQ for veterinarians

33



**COVID-19**      **COVID-19**

**QUARANTINE**      **QUARANTINE**

**COVID-19**      **COVID-19**

**COVID-19**      **COVID-19**

**EASING RESTRICTIONS**      **ELECTIVE SURGERIES**

34



35



36

## COVID-19 HOSPITALS

They reached for alternatives  
 Next available drug on the list  
 Familiarity decreases with each change  
 Increases risk



37

## Where are veterinarians? Now? Down the road?

40% having trouble  
 Ordering from multiple distributors

Midazolam - almost impossible to get  
 Propofol, dexmedetomidine - on allocation  
 Morphine, hydromorphone, fentanyl, morphine:  
     on allocation or not available  
 Ketamine - starting to see shortages  
 Lidocaine, bupivacaine - in shortage

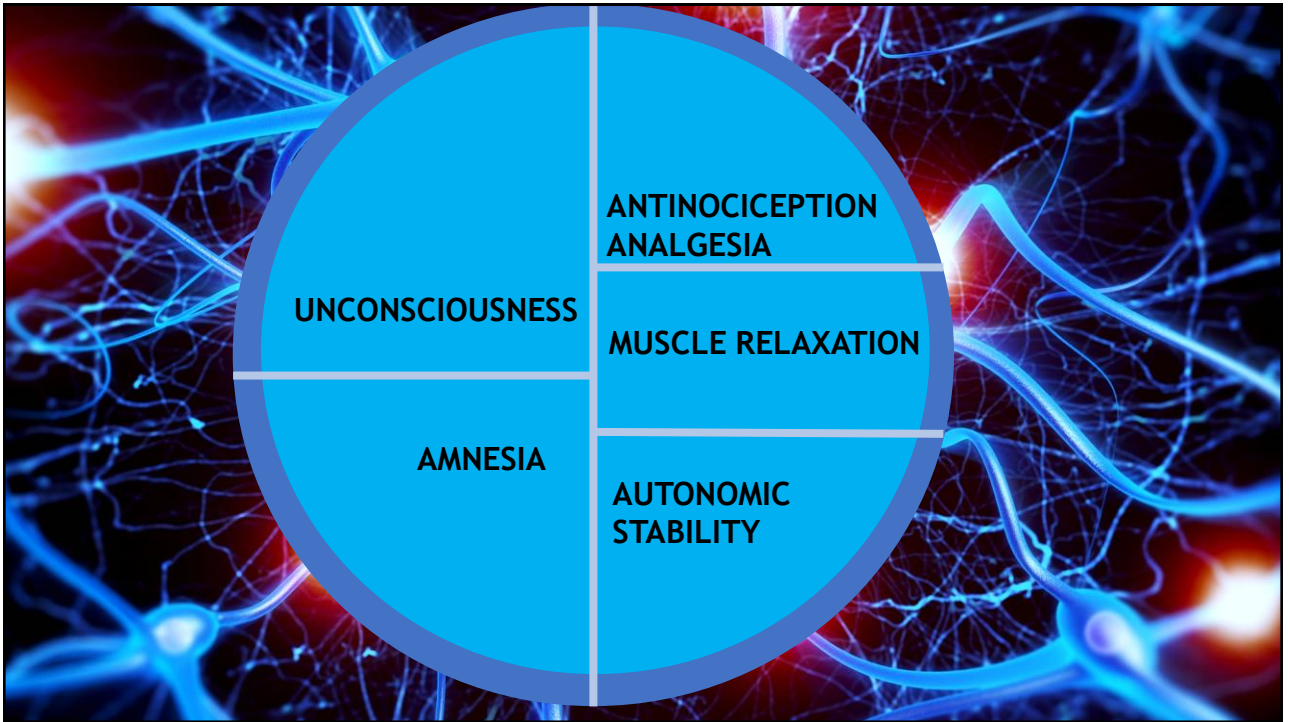
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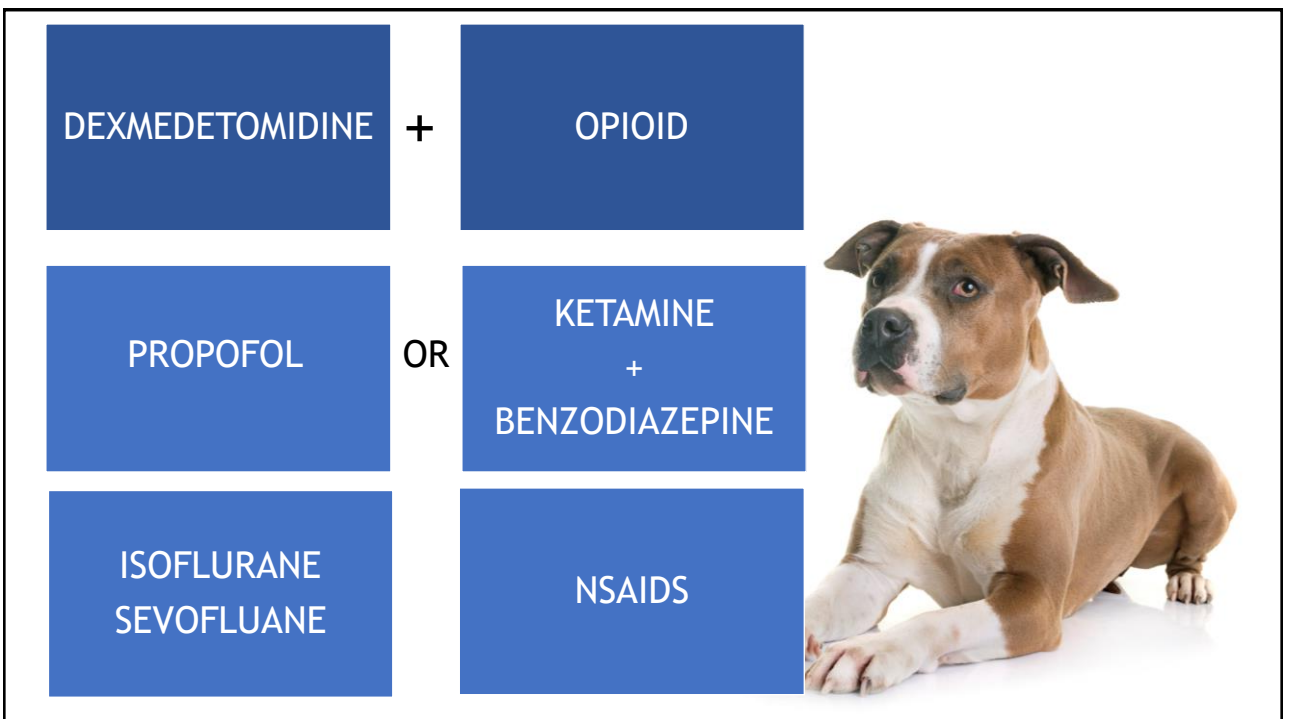
39




40




41



42

	OPIOID	
ISOFLURANE SEVOFLURANE	NSAIDs	

43

Dexmedetomidine Ketamine Butorphanol or Buprenorphine	
Sevoflurane Isoflurane	

44

## Veterinary only drugs



Acepromazine

Medetomidine, xylazine

Tiletamine/zolazepam

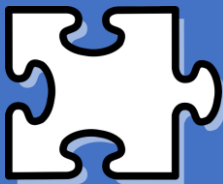
Alfaxalone [Alfaxan®]

Propofol\*

Ketamine\*

45

## ANALGESICS



## NSAIDS

Butorphanol

Buprenorphine

Buprenorphine SR

Simbadol™ [buprenorphine]



46

## ORAL SEDATION



Gabapentin  
Trazodone  
Melatonin

47

## Make a plan



Which **alternatives** to order

How can you **conserve** specific drugs

**Training sessions** for the team with new protocols

Continuing education

Consult

48

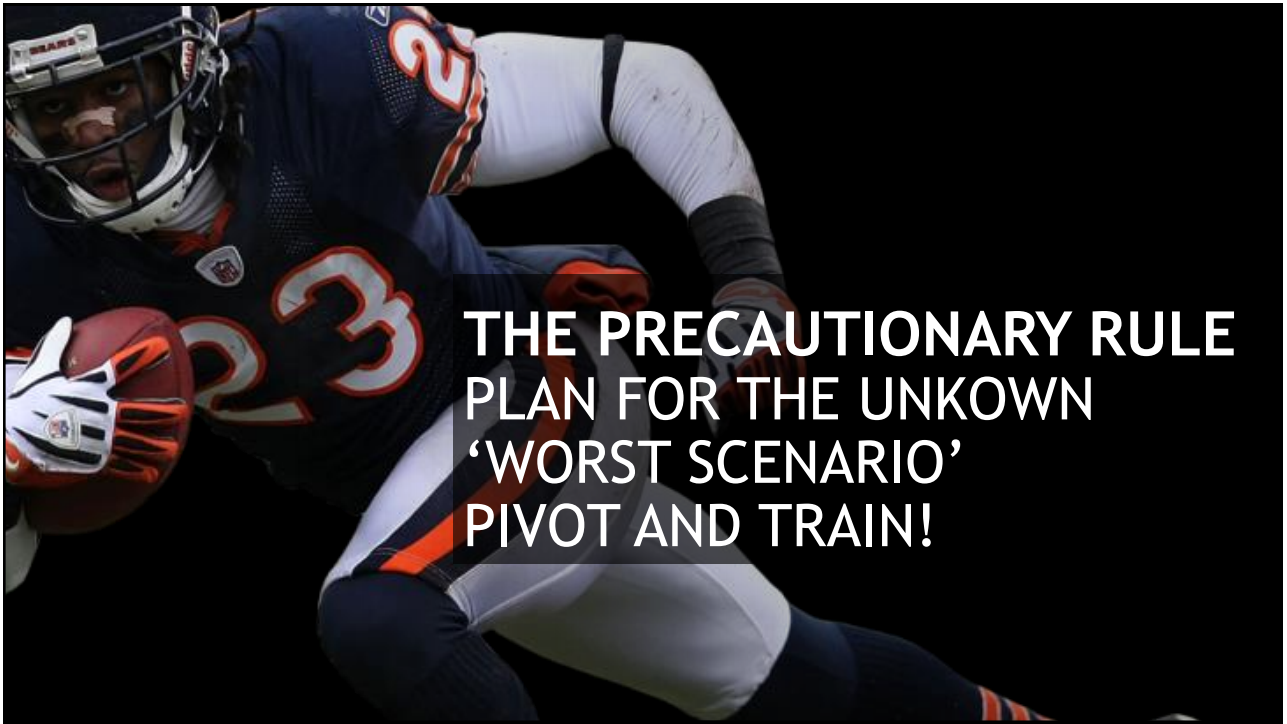




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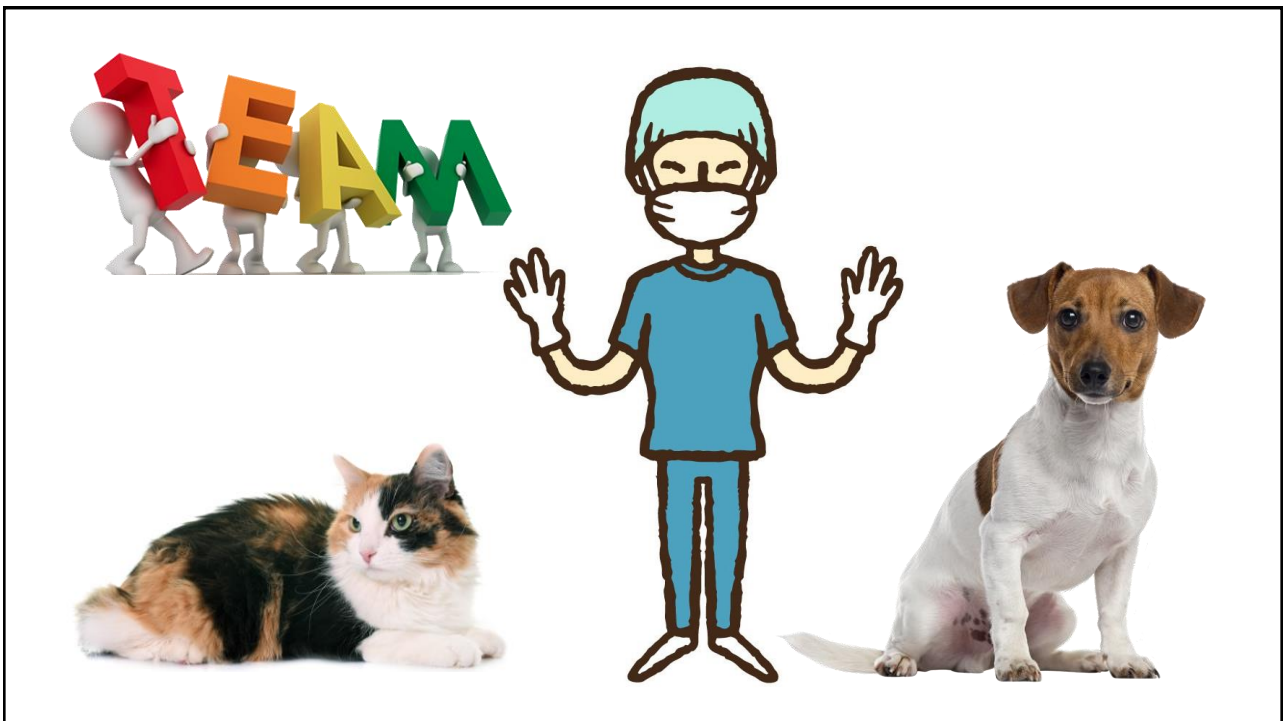


50



**THE PRECAUTIONARY RULE  
PLAN FOR THE UNKNOWN  
'WORST SCENARIO'  
PIVOT AND TRAIN!**

51



52

# Alfaxalone®



Australian based Family owned company

USA - 30% have not used it  
20% have it but don't use it very often

53

[www.thinkanesthesia.education/](http://www.thinkanesthesia.education/)



Race approved - free CE

54



**An Evidence Based Comparison:  
Alfaxalone versus Propofol**

CE Credit: 1



**Alfaxalone: An Update in the  
Advancement of Injectable  
Anesthesia**

CE Credit: 1

55



Customer Services  
[1-844-253-2926](tel:1-844-253-2926)

**Zoletil<sup>®</sup> for Injection** <sup>U.S.</sup>  
(tiletamine and zolazepam for Injection)

**Convenient & Versatile**

**2 MOLECULES, 1 INJECTION**

**2-in-1 combined anesthesia**  
Dogs - for restraint and minor procedures  
Cats - for restraint and anesthesia combined with muscle relaxation.

Zoletil<sup>™</sup> for Injection delivers:

- Rapid onset of action
- Wide therapeutic window



**PURCHASE  
9 VIALS AND  
RECEIVE 3  
AT NO CHARGE**

June 1 - August 15, 2020



56

# MEDETOMIDINE

## levomedetomidine + dexmedetomidine



57



Modern Veterinary Therapeutics, LLC



### US Distributers

1. Victor medical company
2. DV medical supply
3. HSB veterinary supply
4. VEDCO
5. First veterinary supply
6. MWI animal health

58

NDC 015914-005-01

**Medetomidine Hydrochloride**  
(medetomidine hydrochloride)

Sterile Injectable Solution  
**1.0 mg/mL**

Sedative & Analgesic  
For use in dogs only

Net contents: 10 mL

Caution: Federal law restricts this drug to use by or on the order of a licensed veterinarian.

ANADA 200-610  
Approved by FDA



**Alfaxan<sup>®</sup> Multidos**  
(alfaxalone) 10 mg/mL  
intravenous injectable anesthetic for use in cats and dogs



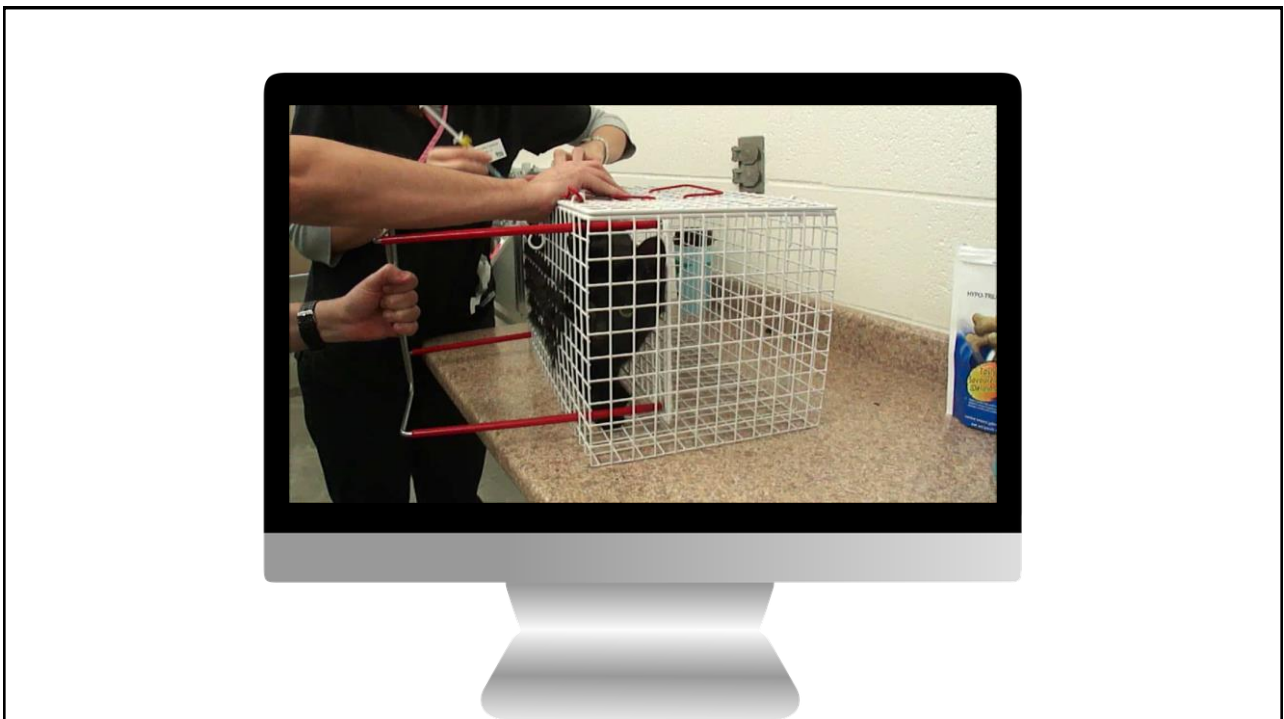
NDC 58399-112-20  
**Butorphanol INJECTION**  
BUTORPHANOL TARTRATE  
Veterinary Injection  
contains 10 mg butorphanol base per mL, as butorphanol tartrate  
**20 mL**



**10.0 µg      1.0 - 2.0 mg      0.2 mg**

**Per kg = 0.13-0.23 mL/kg**

59



60



## COVID-19 Resources



DOWNLOAD THE GUIDE >



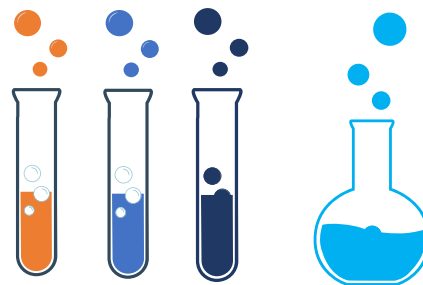
COVID-19 Spay/Neuter and Wellness Clinic Preparedness Guide

<https://network.bestfriends.org/covid-19/lifesaving-programs/covid-19-sn-clinic-guide>

61

## “Premixes”

Tiletamine/Zolazepam  
Butorphanol or buprenorphine  
Dexmedetomidine



TOPICAL REVIEW

## Anesthesia in Shelter Medicine

Jeff C. Ko, DVM, MS, DACVA,<sup>a</sup> and Aime G. Berman, VMD<sup>b</sup>

62

## Tiletamine-zolazepam/Medetomidine/Butorphanol [TMB] Combination for CATS

### Drugs required:

1. Tiletamine-zolazepam in dry powder format
2. 2.5 mL of **Medetomidine** 1 mg/mL (1000 microg/mL)
3. 2.5 mL of Butorphanol 10 mg/mL

### Preparation:

Reconstitute 1 bottle of Tiletamine-zolazepam dry powder with 2.5 mL of medetomidine and 2.5 mL of Butorphanol.

63

DRUG	CONCENTRATION IN MIXTURE
Tiletamine-zolazepam	100 mg/mL
Medetomidine	0.5 mg/mL
Butorphanol	5 mg/mL

**DOSE**  
0.03-0.035 mL/kg IM



64



## Conserving drugs Pre-euthanasia sedation

- Oral *trazodone*
  - Ketamine: 0.1ml
  - Acepromazine: 0.1ml
  - Xylazine (100 mg/ml): 0.05ml
  - ± Butorphanol: 0.05ml
- Per 4.5 kg [10 lb] SC or IM



 [LapofLove.com/Resources](https://LapofLove.com/Resources)

 Password: DVMSUPPORT

65



We can learn to adapt

66

