

THE USE OF COMPOUNDED MEDICATIONS IN MCAS:
Clinical Pearls on the Use of Compounded Medications for Highly Reactive MCAS Patients

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If your patient has a reaction within the first few doses of taking a new medication, consider they are having an excipient reaction. Try a brand instead of generic or try a different manufacturer. Look up the inactive ingredients and try to find the common ingredient your patient may be reacting to.

A way to bypass excipient reactions is to use a compounding pharmacy.

Look for a PCAB accredited compounding pharmacy. The Pharmacy Compounding Accreditation Board (PCAB) is a service of the American Commission for Health Care and assesses pharmacies' compounding processes based on a specific set of standards which focus on the quality and consistency of the medications produced.

Find a PCAB accredited compounding pharmacy
<https://www.achc.org/pcab-accredited-providers.html>

Walgreens and Pharmaca have compounding divisions as well.

Best to make friends with your local compounding pharmacist.

A Quality Compounding Pharmacy:

- Sources active ingredients only from vendors who test and verify every lot. ie wholesaler PCCA, performs over 14 checks and analyses on every batch it receives and repacks for pharmacies.
- Uses the most advanced technology in the compounding industry. For example, ointment mills, homogenizers, and speed mixers make ingredients microsized and uniform throughout. Resonant acoustic mixer for dry ingredients fills capsules, which provides the most thorough mixing possible.
- Bar-codes all medication ingredients and performs error calculations on all capsule batches
- Regularly, sends a percentage of daily volume of prescriptions to an outside laboratory for testing to ensure appropriate potency.
- Performs sterility and endotoxin testing on every sterile medication

MEDICATION OPTIONS:

For patient who are having excipient reactions you want to source the pure powder. Pharmacy can also crush up tabs or open capsule and re-encapsulate but this will contain original excipients and binders.

In general, generic meds may be available. Brand medications are not

Medication class:	Medication used for MCAS Tx	Active ingredient available in pure powder?
H1 Blockers:		
	loratadine	Yes
	levocetirizine	Yes
	cetirizine	No
	fexofenadine	Yes
	diphenhydramine	Yes
	hydroxyzine	Yes
	doxepin	Yes
	cycloheptadine	Yes
H2 Blockers:		
	famotidine	Yes
	ranitidine	Yes
Mast Cell Stabilizers:		
	cromolyn	Yes
Leukotriene inhibitors:		
	ketotifen	Yes
	zileuton	No
	montelukast	Yes
SSRIs:		
	sertraline	Yes
	fluoxetine	Yes
	paroxetine	No
	citalopram	No
	escitalopram	No
	trazodone	Yes
IgE Antagonist:		
	omalizumab	No
Tyrosine kinase inhibitors:		
	imatinib	No
	dasatinib	No
	sunitinib	No
Stimulants:		
	amphetamine-dextroamphetamine	No
	methylphenidate	Yes

	dextroamphetamine	Yes
TNF alpha inhibitors:		
	infliximab	No
	etanercept	No
	adalimumab	No
Opiates:		
	tramadol	Yes
	fentanyl	Yes
	hydromorphone	No
	morphine	Yes
	hydrocodone	Yes
	oxycodone	Yes
NSAIDs:		
	aspirin	Yes
	ibuprofen	Yes
	naproxen sodium	Yes
	celecoxib	No
	ketoprofen	Yes
	flubriprofen	Yes
	diclofenac	Yes
Others:		
	hydroxyurea	Yes
	ivabradine	No
	pentosan	Yes
	dronabinol	No
	aprepitant	No
	rituximab	No
	low dose naltrexone	Yes can put in capsules, cream, SL drops 0.1ml but not sure how well it is absorbed
Benzos:		
	lorazepam	Yes
	diazepam	Yes
Glucocorticoids:		
	dexamethasone	Yes
	prednisone	Yes oral
	hydrocortisone	Yes oral
	fluticasone	Yes
	clobetasone	Yes

Supplements:		
	diamine oxidase	No
	quercetin or other flavonoids	Yes
	alpha lipoic acid	Yes
	N-acetylcysteine	Yes
	vitamin C	Yes
Other Commonly used Meds:		
Blood pressure:	lisinopril	Yes
	benazepril	Yes
	metoprolol	Yes
	atenolol	Yes
	amlodipine	Yes
	hydrochlorothiazide	Yes
	losartan	No
Diabetes:	metformin	Yes
Thyroid:	T3 and T4	Yes
Antibiotics:	ciprofloxacin	Yes
	azithromycin	Yes
	clindamycin	Yes
	metronidazole	Yes
	penicillin	No
	cephalosporins	No
Statins:	simvastatin	Yes
PPI:	omeprazole	Yes

Medication delivery options:

- capsules
- liquids
- cream
- inhalation
- nebulizer

Capsules:

- overall are very easy to use
- Advantages:
- longer shelf life, 180 day shelf life
- can customize capsule and binder

Cap Fillers

- Lactose	- Acidophilus
- Microcrystalline Cellulose	- Ascorbic acid-Acidic be careful

- Ginger root	
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Capsules

- Gelatin – well tolerated (Not vegetarian)	- Cellulose

Clinical Pearls:

Get sample of plain capsules:

Get sample of gelatin capsules and preferred filler from compounding pharmacy prior to putting med in it to make sure patient tolerates capsule and filler.

After getting sample of pills and making sure no reaction, then fill a relatively small amt to make sure no reaction to medication. Otherwise, patient may end up with large and expensive amount of medication that they can't use.

Once tolerated, to assist patients with titrating up slowly, prescribe larger and smaller sized caps ie. cromolyn 200 mg cap and 50 mg caps.

Consider compounding other meds patient is taking:

Consider compounding other meds for pts that are highly reactive, ie. thyroid, blood pressure meds.

Add Medical Justification to Rx:

If you are prescribing loratidine 10 mg, which is available commercially, need to add on Rx medical justification for compounded med. Ie "patient is allergic to fillers in commercially available product"

Not necessary to include if the product isn't available ie montelukast cream, but it's a good idea to add medical justification

Liquids:

- Often have shorter shelf life than capsules
- May have to use other ingredients that patient could react to.

2 options:

SL drops:

- olive oil or almond oil
 - Most drugs are not oil soluble – need to be shaken vigorously
 - i.e ketotifen can make it into SL drops because it's potent and only small volume is needed.
- 180 day shelf life
- Stored at room temperature

Oral Suspension:

- purified water, which is thickened with cellulose

- Shelf life of only 14 days
- Requires refrigeration
 - For instance, ketotifen is water soluble so it can be made into oral suspension. Pharmacist can tell you if med is water or oil soluble
 - Cromolyn can be made into oral suspension ie 100 mg / tsp. Pharmacist can check online for stability studies. Ie stability study done on cromolyn show 56 day stability for cromolyn in thickened water. Can use these studies to adjust for longer shelf life.

Cream:

- Are you treating the skin or are you looking for systemic absorption?
- Bypasses gut
- Systemic absorption
 - Transdermal Base- Tolerated well, consider if pt's gut is problematic
 - Ie Lipoderm- con: greasy, contains soy lecithin (non-gmo?)
 - 30 day shelf life
 - I've done montelukast in lipoderm
 - It's an option for any drug that is available as powder
- Topical applications
 - ie Versa base or another cream of pt's preference.
 - naltrexone 1% for eczema, wound healing
 - ketotifen cream

Inhalation:

- Bypasses gut as well
- cromolyn or ketotifen nasal spray can be made, mixed only with water.
 - However, they may use acidic or basic buffers to pH balance ie citric acid or sodium hydroxide.
 - 14 day shelf life
 - Commercially available cromolyn or ketotifen eye drops can be used in nose but not the reverse.
 - Ie. To use Ketotifen eye drops in nose or SL ketotifen $0.025\% = 0.25 \text{ mg/ml} = 20 \text{ gtt}$. $1 \text{ gtt} = 0.125 \text{ mg}$ which is a very low dose. Can be useful for people who are titrating up slowly at the start. Does contain benzalkonium chloride however.

Nebulizer:

- Bypasses gut
- glutathione can be made for use in a nebulizer to aid in detoxification