Help! My Patient Doesn't have Much Money: **Cost Effective Prescribing to Treat Common Illnesses** Amelie Hollier, DNP, FNP-BC, FAANP Lafayette, LA President, APEA Speaker has no relationship to disclose. **Objectives** • Describe cost effective strategies to manage common chronic illnesses (40 mins) • Develop cost effective strategies to manage common acute illnesses using OTCs and generic medications (15 mins) **Develop strategies to increase cost effectiveness** of current medication regimen (20 mins)

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- Get the most "bang for the buck" with good med selection!
- Insure that we avoid drug-drug and drug-disease interactions that decrease the effectiveness of meds the patient takes!

One way to be a cost-effective Prescriber...

\$4 Generic Medications

Hypertension

Lifestyle Modifications

- Maximize Non-pharm Management
- Institute lifestyle modifications (change in diet, increase physical activity, weight loss)

Hypertension

Lifestyle Modifications

- DASH eating plan (8-14mm Hg)
- Weight loss (5-20 mm Hg/ 10kg)
- Exercise: 30 min most days (4-9mm Hg)
- Sodium restriction (2-8 mm Hg)
- EtOH in moderation (<2 drinks/d): (2-4mm Hg)
- Eliminate other CV risk factors

Anti-Hypertensives

How do I pick one?

Multiple \$4 Generics Available

- Thiazide diuretics
- ACE inhibitors
- ARBs
- Alpha blockers and BB
- CCBs

Diuretics:

How do I pick one?

Multiple \$4 Generics Available

- HCTZ
- Potassium sparing
- Indapamide
- Loop diuretics

Hydrochlorothiazide

Most commonly prescribed diuretic for HTN *in the world!*

- Mild antihypertensive agents
- · Half life 6-12 hours
- Best used as synergists, unless minimal decrease in BP needed

Take Home Point!

 Limit HCTZ to 25 mg per day of HCTZ

WHY?

And, make sure there is adequate potassium on board! WHY?

Indapamide (Lozol)

Thiazide diuretic

- · Half life is about 14 hours
- Indications: HTN, salt and fluid retention associated with HF
- Disadvantage: Not found in combo with other BP meds
- · Cheap! (\$4 drug)

Indapamide

Thiazide diuretic

- 1.25 mg daily; if not at BP goal after 4 weeks, increase to 2.5 mg daily
- 2.5, 5, 10 mg tabs demonstrated equal efficacy

Consider changing plan if goal BP not achieved by 8 weeks

Thiazide Diuretics HCTZ, indapamide, chlorthalidone

- Systolic reduction: 5-16.4 mmHg
- Diastolic reduction: 2-9.3 mmHg
- Minimal decreases in potassium (consider checking potassium levels after 2 weeks of therapy)
- Keep K+ at least 4 meg/L

Take Home Point! Need a thiazide?

- · Consider indapamide
- More evidence for improving cardiovascular outcomes than **HCTZ**

Potassium-Sparing Diuretics

- · Weak antihypertensive agents
- · Advantage: They spare potassium!!!!
- · Good in combo with thiazide or a loop for K sparing ability

Examples: Triampterene, spironolactone, eplerenone

Loop Diuretics

- POTENT!
- Do not decrease BP as much as thiazides; cause excretion of more Na than thiazides
- For HTN, stay away from the loops!

Examples: Furosemide, budesonide, ethacrynic acid,

ACE Inhibitors: How do I pick one?

Multiple \$4 Generics Available

- Lisinopril on all lists
- Benazepril
- Enalapril

Are all the ACE INHIBITORS

created equally?

Comparison of ACE I					
Drug name	Frequency of dose	Half-life in hours			
Benazepril	Daily	10-11			
Captopril	2-3 times	1-2			
Enalapril	1-2 times	13			
Fosinopril	1-2 times	12			
Lisinopril	Daily	12			
Moexipril	1-2 times	2-9			
Perindopril	1-2 times	8-10			
Quinapril	1-2 times	2-3			
Ramipril	1-2 times	12-17			
Trandolapril	Daily	16-24			

ACE-I Once Daily?

- These drugs *may need* to be dosed BID
- A lot of patients get more punch out of 20 mg BID vs 40 mg once daily

Rx Case 1:

Patient takes lisinopril 10/HCTZ 12.5

- Lisinopril 10/HCTZ 12.5 mg tab
- Lisinopril 20/HCTZ 25 mg tab

Can you split a Lisinopril 20/HCTZ 25 mg tab to get two doses?

Pill Splitting

Don't split if tablet contains more than ONE active ingredient

- Lisinopril/HCTZ
- Combo antihypertensive medications

Pill Splitting Clues

The tablet is scored

Pill Splitting Clues

Don't split if enteric coated, sublingual, or buccal, some extended release tablets

Anti-Hypertensives

ARBS (not \$4)

- Not on \$4 lists generally
- Consider transitioning to an ACE inhibitor
- Losartan, irbesartan, valsartan, candesartan are generic (not \$4)

ARBs					
ARB Usual Daily Dose in Daily Frequency					
Azilsartan	40-80	1			
Candesartan	8-32	1			
Eprosartan	600-800	1 or 2			
Irbesartan	150-300	1			
Losartan	50-100	1 or 2			
Olmesartan	20-40	1			
Telmisartan	20-80	1			
Valsartan	80-320	1			

Angiotensin II Blockers Specific Agents

- Candesartan
- Losartan Repeated data
- Irbesartan *supports*
- renoprotective Valsartan
- effects in this • Telmisartan (Micardis®) class of drugs
- Eprosartan (Teveten®)
- Olmesartan (Benicar®)
- * All are coupled with HCTZ

Losartan is oldest and most studied

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Rx Case 2:

Patient takes lisinopril 10/HCTZ 12.5

• Developed an ACE cough

He really needs RAAS inhibition.

Generic ARBs

- Irbesartan <\$12 (300 mg daily)
- Losartan <\$10 (100 mg daily)
- Olmesartan <\$15 (40 mg daily)
- Valsartan <\$20 (320 mg daily)
- Candesartan <\$42 (32 mg daily)

Internet Search

Many instances of generic ARBs (\$9/month)

Needs a savvy patient!

- Apps (GoodRx.com)
- Coupons
- Blinkhealth.com
- Canadian pharmacies

Win-Win!

- One medication that helps2 problems
- Example: HTN, gout

Angiotensin II Blockers What about gout?

- Losartan indicated in gout (inhibits urate ion transport and decreases uric acid levels)
- Uric acid indicated as possible CV risk factor

Take Home Point!

ARBs are less effective if a beta blocker is on board since BB reduce renin secretion and less AT I, II is formed.

Same is true for an ACE!

Beta-Blockers Indications

- No longer recommended first line for uncomplicated hypertension
- Post MI, HF, asymptomatic LV dysfunction
- CAD, angina, a-fib
- Tachyarrhythmias
- Migraine headaches plus HTN
- Symptomatic hyperthyroidism

Beta Blockers: How do I pick one?

Multiple \$4 Generics Available Atenolol Carvedilol

Metoprolol tartrate

Beta Blockers:Migraine Prophylaxis

Atenolol BID

NOT CARVEDILOL!!!

Metoprolol tartrate BID

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Beta Blockers

HTN, HF, Angina, others

- Metoprolol tartrate (twice daily): \$4 med
- Make sure they are BID!!!!!
- •Metoprolol succinate (once daily) but not USUALLY on \$4 list

Calcium Channel Blockers:

How do I pick one?

Multiple \$4 Generics Available

Verapamil

Diltiazem

NOT AMLODIPINE usually

Ca Channel Blockers

- 2 Groups of calcium channel blockers:
 - 1. Dihydropyridines (DHPs)
 - 2. Non-Dihydropyridines (non-DHPs)

Ca Channel Blockers Types of Agents

DHPs

Decrease BP, not HR amlodipine felodipine (Plendil®) nicardipine (Cardene®) nifedipine (Procardia®) nisoldipine (Sular®)

Non-DHPs

Decrease HR DILTIAZEM:

(Cardizem®, Dilacor®, Tiazac®)

VERAPAMIL:

(Isoptin®, Calan®,Covera® HS, Verelan®)

Ca Channel Blockers Indications

- Isolated Systolic Hypertension (DHP)
- Angina (non-DHP, DHP)
- Atrial tach and a-fib (non-DHP)
- DM with proteinuria (non-DHP)

 ACE preferred
- Migraine (non-DHP)

Ca Channel Blockers \$4 Generics

- Diltiazem (non-DHP)
- Verapamil (non-DNP)

Amlodipine: \$4 Walmart, Sam's, others

Take these at nighttime for better punch!!!

Internet Search

Many instances of generic amlodipine (\$9/month)

Needs a savvy patient!

- Apps (GoodRx.com)
- Coupons
- Blinkhealth.com
- Canadian pharmacies

Dyslipidemia

Lipid Lowering Meds \$4 generics

Lovastatin

Pravastatin

Simvastatin

Statin Cost v. Efficacy				
Statin Name	% LDL lowering	Cost		
Atorvastatin	35-60%	10-80 mg: \$4-10 (generic)		
Rosuvastatin	45-63%	5-40 mg: \$14 regardless of dosage		
Simvastatin	26-41%	20 mg: \$<4 (generic)/ \$20.26 (generic)		
Pitavastatin	29-45%	2 mg: \$150		
Pravastatin	22-37%	40 mg: \$18.82 (generic)/ \$18.65 (generic)		
Lovastatin	21-42%	40 mg: \$<5 (generic)/ \$29.11 (generic)		

CYP 450 Effect				
	Atorvastatin	Simvastatin	Lovastatin	
LDL Decrease	35-43% 10-20mg	29-41% 10-40 mg	24-42% 20-80 mg	
CYP 450 Effect	3A4	Strong 3A4, 3A5	3A4	
	Pitavastatin	Pravastatin	Rosuvastatin	
LDL Decrease	36-45% 2-4 mg	29-37% 20-80 mg	45-49% 5-10 mg	
CYP 450 Effect	2C9, limited 2C8	Not significantly metabolized by CYP 450	Limited 2C9	



Making the Most

of the \$4 generics

Can you take (two) 40 mg tabs = (one) 80 mg tab? (\$8)

- Pravastatin 80 mg (30 tabs)
- Price range: \$18.99- \$119.99 (without shipping)

Statin Tolerability

- Muscle aches!!!
- Most common complaint reported by statin users
- >70% are able to tolerate statin
- Statin intolerance app:

http://www.acc.org/statinintolerance App

General Complaints

- Consider other illnesses:
 hypothyroidism, vitamin D deficiency,
 rheumatologic or musculoskeletal
 disease, exercise, steroid myopathy,
 antipsychotics, immunosuppressants,
 bisphosphonates, EtOH or drug abuse,
 drug or food interactions (fibrates,
 macrolides, protease inhibitors, etc.)
- If illness found to be the cause, treat, restart the statin at the same dose

Statin Myalgias

- Inhibition of Coenzyme Q10 production?
- Decreased cholesterol content in muscle cell membranes?

Coenzyme Q-10

- Made by humans every day
- Cofactor in several metabolic pathways
- Ingested in fish, meats, soybean oil
- Expensive anti-oxidant
- Statins impair your ability to make Coenzyme Q-10

Coenzyme Q-10

- Placebo controlled crossover rechallenge, CoQ10 600 mg daily did not affect pain, strength, or aerobic performance vs placebo
- Evidence Level B; lower quality RCT

Mancini GB, Tashakkor AY, Baker S, et al. Diagnosis, prevention, and management of statin adverse effects and intolerance: Canadian Working Group Consensus update. Can J Cardiol 2013; 29:1553-68.

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Coenzyme Q-10

- Anecdotally, some patients say it helps
- Some swear by it!

Myalgias/Costs: Other thoughts

- Consider rosuvastatin or atorvastatin M-W-F or Tues or Thurs
- Can reduce LDL by 30%
- Once weekly: LDL reduction 10%
- Check lipids on M-W-F if statin 3 times
 weekly
- No CV mortality data on this regimen!

Mancini GB, Tashakkor AY, Baker S, et al. Diagnosis, prevention, and management of statin adverse effects and intolerance: Canadian Working Group Consensus update. Can J Cardiol 2013; 29:1553-68.

Why Rosuvastatin? Why Atorvastatin?

- Rosuvastatin: long half-life, favorable drug interaction profile
- Atorvastatin: long half-life, less favorable profile
- LDL reduction: Atorvastatin 20 mg daily=atorvastatin 3x weekly
- No CV mortality data on this regimen!

Pramanik S, Das AK, Chakrabarty M, et al. Efficacy of alternate day versus everyday dosing of atorvastatin. Indian J Pharmacol 2012;44:362-5.

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GERD Meds

\$4 generics

- No PPIs
- Ranitidine 150 mg, 300 mg
- Lifestyle modifications definitely beneficial!

Question to ask NP!

Is your patient on a calcium channel blocker?

If yes, that might be a drug-disease interaction.

Ca Channel Blocker:

Mechanism of Action

Can you change the antihypertensive med?

H2 Blockers

H2 Blocker	Generic	How Metabolized
Tagamet	Cimetidine	Multiple enzymes inhibited and used for metabolism (3A4)
Pepcid	Famotidine	Min CYP 450 involvement
Axid	Nizatadine	Min CYP 450 involvement
Zantac	Ranitidine	Min CYP 450 involvement

Timing based on Mechanism of Action

H2 blockers: decrease acid production; OK to take at bedtime

PPI: inhibit the gastric parietal cell H/K pump (take before meals)

Take Home Point! Don't waste a PPI at bedtime!!!

GERD Meds

OTC PPIs

PPI	Price/30 days
Omeprazole 20- 40 mg (Prilosec)	\$4-9
Pantoprazole (Protonix)	\$4-9
Lansoprazole (Prevacid)	\$13-18

Proton Pump Inhibitors

7 Different ones on the Market

- •No clinically significant difference for esophagitis healing, symptom relief, prevention of GERD relapse
- •None clinically significant for treating ulcers, NSAID induced ulcers, duodenal ulcers or *H. pylori*
- •No difference in side effects

Gastroenterology, 2008; 135:1392-1413

Proton Pum	Proton Pump Inhibitors			
Drug Ir	nteractions			
PPI	How Metabolized			
Dexlansoprazole	2C19, 3A4			
Lansoprazole	2C19, 3A4, induces 1A2, inhibits 2C19			
Omeprazole	2C19, 2C9, 3A4; inhibits 2C19, 2C9; induces or inhibits 1A2			
Esomeprazole	2C19, 3A4, inhibits 2C19			
Omeprazole + Na bicarb	2C19, 2C9, 3A4; inhibits 2C19, 2C9, induces or inhibits 1A2			
Pantaprazole	2C19, 3A4; inhibits 2C19			
Rabeprazole	2C19, 3A4; inhibits 2C19			

H2 Blockers

All inexpensive

All OTC

All generic

Onset of action 1-2 hours

Duration: 6-12 hours for most

Thyroid Disease: Hypothyroidism

2018 TOP 20 Prescribed Rx's			
Medication	Medication		
1. Lisinopril	11. HCTZ		
2. Levothyroxine	12. Losartan		
3. Atorvastatin	13. Gabapentin		
4. Metformin	14. Sertraline		
5. Simvastatin	15. Furosemide		
6. Omeprazole	16. Acetaminophen		
7. Amlodipine	17. Atenolol		
8. Metoprolol	18. Pravastatin		
9. Acetaminophen/hydrocodone	19. Amoxicillin		
10. Albuterol	20. Fluoxetine		
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6025009/figure/pharmacy-06-00043-f001/. Accessed: jan, 2019.			

Quiz:

How do you manage generic levothyroxine for a patient who has hypothyroidism?

Generic Levothyroxine Minimizing Fluctuations

Patient should:

- Get a large supply consider 6 months
- Keep in a cool place-degrades easily
- Use same pharmacy, same generic manuf when possible!
- Monitor symptoms when manufacturer changes

Many Medications Effect TSH Minimizing Fluctuations

Provider should ask about:

- H2 Blockers, PPIs, simethicone, sucralfate
- · Ca, Fe, Mag, Al
- Bisphosphonates
- Statins: decrease of 0.17 mU/L
- Others

Irving SA, Vadiveloo T, Leese GP. Drugs that interact with levothyroxine: an observational study from the Thyroic

Finally,......
Please do NOT split your
Brand OR Generic thyroid
supplement!

Narrow Therapeutic Agents

Warfarin Levothyroxine

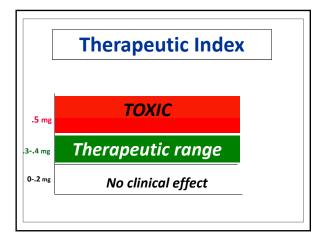
Digoxin

Lithium

Phenytoin

Theophylline

(Toxic dose may be slightly above therapeutic dose)



Take Home Point!

Don't split if medication is a narrow therapeutic agent

- Warfarin
- Levothyroxine
- Anti-seizure medications
- Others

Pain: NSAIDs

What \$4 NSAIDs?

COX-1

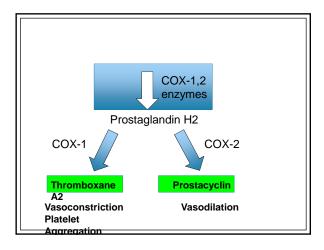
COX-2

- Ibuprofen 400-800 mg
- None
- Diclofenac 75 mg
- Indomethacin 25 mg
- Naproxen 375, 500 mg

COX-1.5

Meloxicam

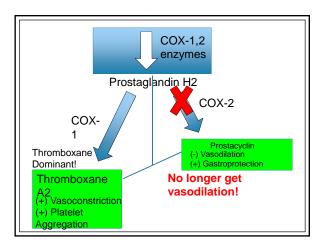
Cardiovascular Risks

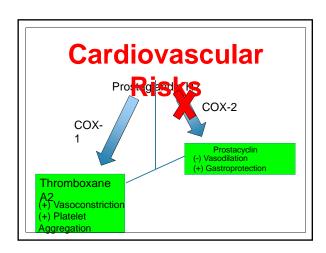


Cardiovascular Risks

COX-2 (less GI risk, greater CV risk)

- Celecoxib
- Meloxicam
- Rofecoxib (Vioxx)
- Valdecoxib (Bextra)





Minimizing CV Effects

Consider

- Shortest acting NSAID for shortest duration
- Naproxen in cardiac risk patients (if not aspirin)

Renal Risks

NSAIDs and Renal Prostaglandins NSAID on Board **Prostaglandin Effect** Maintain renal blood flow Acute renal failure and GFR BP rises! Cardiac output Antagonize systemic vasoconstriction worsens in HF Renin secretion is increased Hyperkalemia develops if underlying renal insufficiency Increase sodium excretion Intense sodium retention; impaired response to diuretics

Strategies to Prevent Renal Complications

with Long-Term NSAID Use

- Monitor blood pressure
- Keep the kidney well hydrated!
- Lowest dose for shortest period of time

Depression

- Most meds are similarly effective!
- None more effective than another
- Choose one based on side effects (or lack of them!)

American Psychiatric Association. Practice guideline for the treatment of patients with major depressive disorder (3rd Edition). October 2010. http://www.psych.org/guidelines/mdd2010. (Accessed January 18, 2019).

Depression

SSRIs

- Citalopram
- Fluoxetine
- Paroxetine
- Sertraline

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Depression

Depression with insomnia

- Consider paroxetine (\$4 generic med)
- Consider a sedating TCA (\$4 generic med)
- Mirtazapine (Remeron) generic; some \$4 lists
- TCA and mirtazapine associated with weight gain

Depression

Depression with fatigue, sleepiness

- Consider bupropion SR (BID, not on all \$4 lists)
- Consider a less sedating SSRI: fluoxetine

Depression

Depression with fatigue, sleepiness

- Generic but not \$4:
- Venlafaxine ER: 37.5-150 mg (\$9.10-11)
- Bupropion XL: 150-300 mg (\$9-21.66)
- ***Less weight gain, fewer sexual side effects
- *** Hypertension with bupropion, venlafaxine

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Depression

Depression with chronic pain, migraine prophylaxis

- Amitriptyline (10, 25, 50, 75, 100 mg tabs)
- Nortriptyline (10, 25 mg tabs)
- NOT A BETA BLOCKER!
- ***Migraine prophylaxis

Depression

SSRIS (if no response, try a different one)

- Citalopram
- Fluoxetine
- Paroxetine
- Sertraline

McGrath PJ, Stewart JW, Fava M, et al. Tranylcypromine versus venlafaxine plus mirtazapine following three failed antidepressant medications trials for depression: a STAR*D report. *Am J Psychiatry* 2006;163:1531-41.

Asthma, COPD: Exacerbations

Lower Airway Meds Generics

- Prednisone 2.5, 5 mg tabs (\$4)
- Ipratropium neb solution (\$4)
- Albuterol neb solution (\$11)
- Albuterol inhaler (\$9)

Comparison of Steroids

	Dose (mg)	Relative Anti- inflammatory Activity	Duration of Action Hours
Cortisol	20	1	8-12
Prednisone	5	4	12-36
Prednisolone	5	4	12-36
Methylprednisolone	4	5	12-36
Dexamethasone	0.75	30	36-72

Good Steroid Choices

- Asthma: prednisone or prednisolone (less mineralocorticoid activity)
- COPD: Methylprednisolone, prednisone (mentioned in GOLD guidelines)
- Connective tissue disorders (lupus, rheumatoid arthritis): Prednisone, methylprednisolone, prednisolone (well absorbed, single AM dose mimics physiologic cortisol secretion and minimizes HPA suppression)

Allergic rhinitis, Dermatitis

Allergic Rhinitis

- No non-sedating antihistamines are on \$4 lists but 3 are available OTC
- Best prices are found by buying 365 tablets

Anti-Histamines Cost 1st gens cheaper/dose 2nd Gen Anti-Histamine Cost per Dose Cetirizine .05/10 mg (generic) Loratadine .04/10 mg (generic) Fexofenadine .20/180 mg (generic) Cetirizine: sedating, take at nighttime Loratadine: 2D6, 3A4 substrate Fexofenadine: non-sedating, little hepatic metabolism

Topical Nasal Steroids

- Fluticasone Rx generic: about \$19/120 actuations
- Fluticasone OTC: \$5/120 actuations

Internet Search

Many instances of generic fluticasone (\$5-\$9/month)

Needs a savvy patient!

- Apps (GoodRx.com)
- Coupons
- Blinkhealth.com

Dermatitis

\$4 topical steroids

- Hydrocortisone 1%, 5% cream
- Triamcinolone .025%, 0.1%, 0.5% creams/ointments

Topical Steroids

- Atopic dermatitis
- Contact dermatitis
- Psoriasis
- Insect bites/stings
- Many other pruritic conditions

Drug Potency?

Based on the vehicle:

Lotion < Cream < Gel < Ointment

Top Steroids

Vehicle Matters!

- Use creams on thin skin, in infants, older adults
- Use *Ointment* to get more punch!!!

Top Steroids

Vehicle Matters!

Triamcinolone 0.1% (80g tube)

- Use for chronic skin conditions
- Eczema, dermatitis

Top Steroids

Vehicle Matters!

Triamcinolone 0.5% (15g tube)

• Use for acute, itchy conditions

Infections

Free Antibiotics

- Amoxicillin
- Ampicillin
- Cephalexin
- Ciprofloxacin
- Doxycycline, Tetracycline
- Erythromycin
- Pen VK
- SMZ/TMP DS

Don't overlook the Obvious!

7 Obvious Strategies

Making the Most

of the \$4 generics

1. Not all lists are the same

- And the lists change periodically
- End of the quarter---contracts change!
- Example: Benazepril/HCTZ available at Walgreen's but not Wal-mart

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of the \$4 generics

2. Not all generics are on the \$4 list!

• Example: amlodipine, fluticasone nasal spray, losartan, many more!

Ma	king	the t	M	ost

of the \$4 generics

3. Some *doses* of generics are NOT on the list

• Example: Pravastatin 10, 20, 40 mg

4. Order 90 Day supply instead of 30 Days

 Larger quantities (90 day supply usually cheaper than 3-30 day supplies)

Annualized savings:

• 1 script: \$8 (12 months: \$48 vs. \$40)

5 scripts: \$4010 scripts: \$80

5. Free Delivery is Free!!! Let someone else pay for Gasoline!	
6. Always consider \$4 plan \$4 Plan may be cheaper than with ins co-pay	
Making the Most of the \$4 generics 7. Look for ways to combine meds • Example: HCTZ 12.5 mg daily (\$4/30 tabs) • Lisinopril 10 mg daily (\$4/30 tabs)	

Finally,...... Please do NOT split your Birth Control pills!!!!!

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- Free for iPhone, iPod Touch, and iPad
- Online: www.goodrx.com
- Finds lowest price drug in stores AND online
- Taps into generic discount plans
- Gives access to manuf coupons when there is no generic
- Finds prices of generic "equivalents"

3 Other Sites for Coupons

- Lowest Med
- Mobile Rx Card
- Pocket Doctor

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Thank you!

For questions or to contact me:

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