Evaluation of Community Pharmacist Interventions

Designed to Increase the Quality of Drug Therapy

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Introduction

Drug therapy is increasingly becoming the preferred treatment method as patients live longer and with more chronic conditions. The rapid development of drugs has made the process of prescribing more complex and expensive. Physicians, who have generally been responsible for diagnosis and prescribing drug treatment, are having more difficulty maintaining the knowledge needed for prescribing activities. This may result in decreasing adherence to current consensus recommendations leading to an increase in the number of medications needed for treatment, adverse effects, and drug-drug interactions. The end results are an overall lack of optimal drug therapy and greater medical costs. These problems are more prevalent in the elderly.[1,2]

The development of consensus statements from national medical organizations provides a mechanism to address potential problems with drug therapy through the publication of drug therapy guidelines and treatment protocols. There is considerable evidence that despite these efforts problems with drug for the still exist. Managed care organizations have shown increased interest in evaluating the quality of drug therapy as it comes up great a percentage of total healthcare costs. The evaluation of health plans include the extent that medical treatment and service based provided by the plan is based upon acceptable standards for medical practice.[3]

Community pharmacists are uniquely positioned to assist in ensuring the quality of drug therapy because of their knowledge and training, frequent contact with patients, and greater access to medication use history. Community pharmacy is continuing to transition from a product oriented to a service oriented profession. If pharmacists can detect situations where patient drug therapy does not conform with consensus recommendations and make interventions to increase the

percentage of patients whose drug therapy follow these recommendations, then they will have had a significant impact on the medical costs, quality of care, and individual patient's health status. While some pharmacists have demonstrated the ability to provide nontraditional patient focused services, and some insurers have developed payment mechanisms for these services, it is still not accepted by all community pharmacies.

Objectives

To evaluate the ability of community pharmacists to increase the quality of drug therapy this project has the following objectives;

1. Identify potential interventions that would increase adherence to treatment guidelines.
2. Develop training material to educate pharmacists on the treatment guidelines and potential recommendations.
3. Develop data collections forms that assist the pharmacist in obtaining the relevant information to determine if a patient's medication history is consistent with treatment guidelines.
4. Develop data collection forms that capture the cases identified by the participating pharmacists as well as the outcomes of each case.
5. Conduct a training session to educate participants on potential interventions, data collections forms, and study procedures.
6. Evaluate the effectiveness of the training session and provide additional follow-up and support where needed.
7. Collect data on the cases reviewed the community pharmacist and the recommendations made in each case,
8. Perform the appropriate statistical analysis a depending on the type of data collected.

Methods

Treatment guidelines were reviewed to identifying instances where a community pharmacist reviewing a patient medication history can compare the treatment history to treatment guidelines. Potential interventions were selected if the information needed to make appropriate recommendations was typically available to a community pharmacist. For each potential intervention a flow chart and data collection form was developed.

Community pharmacists in the New England area were recruited by announcements distributed by the Massachusetts Independent Pharmacists Association. A training session was developed to review the potential interventions and appropriate recommendations as well as all study procedures. Data collection forms were completed by the community pharmacists and sent to the investigators. The data was put into an electronic spreadsheet and statistical analysis was performed by SPSS Version 16.0.[4]

Results

The review of treatment guidelines resulted in 4 categories of interventions.[5,6,7,8] The interventions involved patients with congestive heart failure, diabetes, hypertension, and elderly patients. An intervention identification form was developed to assist the pharmacist in selecting the appropriate intervention (see appendix). A flow chart that describes the treatment guideline and possible recommendations is contained the appendix. A patient information sheet (see appendix) was also developed to assist community pharmacists in collecting the information needed to make appropriate recommendations. Data collection forms (titled intervention forms for the benefit of the participating pharmacists) were developed and combined to assist the

pharmacist in providing the data needed for this project. These forms are also contained in the appendix.

Recruitment efforts attracted pharmacists from 18 different pharmacies who were willing and able to participate in the study. A total of 22 pharmacists from 14 pharmacies attended the training program. Those who did not attend had various reasons why they were not able to attend. Some individuals continued to be interested in participating in the study. Over the following year an additional 10 pharmacists from 6 additional pharmacies were recruited for a total of 32 pharmacists from 20 pharmacies. They additional participants were trained individually and received similar training to those who attended the group training session.

Informal feedback of the group training session was positive. Any questions or follow-up items as a result of the feedback was addressed and sent to each participant by email or US mail. The feedback was used to modify the session for those who were trained at a later date.

One item that was difficult for many pharmacists was searching for claims to detect potential cases for review. This was the case despite that fact that requirements to participate in the study included the ability to search transactions for specific medications. Our understanding that some of this was due to conversations between the pharmacists and their pharmacy software vendor where the software vendor was stated that the program had this function even though it did not. Due to this unexpected issue we decided not to collect the total number of claims eligible for review and instead our analysis was based upon the cases that were reviewed. To allow the pharmacists' time to identify the cases study participants were allowed to search cases over three

months. The data collection forms were revised to exclude this information. The forms in this report are the revised forms.

All 20 pharmacies participating in the study recorded interventions for patients with congestive heart failure. A total of 61 interventions were recorded. The specific intervention, the individuals receiving the recommendation, the total number of each intervention, and the recommendations resulted in a confirmed change in therapy is contained in Table #1.

Table #1 Congestive Heart Failure Interventions

Intervention	Discussed with patient only n(%)	Discussed with Prescriber and Patient n(%)	Total Interventions n(%)	Change in Therapy Confirmed n(%)
Add Ace Inhibitor	16(26.2)	7(11.5)	23(37.7)	7(30.4)
Add Beta Blocker	11(18.0)	5(8.2)	16(26.2)	4(25.0)
Add Diuretic	15(24.6)	7(11.5)	22(36.1)	5(22.7)
Add Spironolactone	0(0)	1(0.1)	1(1.6)	1(100)
Add Digoxin	0(0)	1(0.1)	1(1.6)	1(100)

Fourteen pharmacies (70%) reported interventions in patients with diabetes. A total of 42 interventions were recorded. The specific intervention, the individuals receiving the recommendation, the total number of each intervention, and the recommendations resulted in a confirmed change in therapy is contained in Table #2.

Table #2 Diabetes Interventions

Intervention	Discussed with patient only n(%)	Discussed with Prescriber and Patient n(%)	Total Interventions n(%)	Change in Therapy Confirmed n(%)
Replace Chlorpropamide	18(42.9)	10(23.8)	28(66.7)	20(71.4)
Replace Metformin	6(14.3)	8(19.0)	14(33.3)	6(42.9)

All 20 pharmacies reported interventions in elderly patients. A total of 288 interventions were recorded. The specific intervention, the individuals receiving the recommendation, the total number of each intervention, and the recommendations resulted in a confirmed change in therapy is contained in Table #3.

Table #3 Elderly Patient Interventions

Intervention	Discussed with patient only n(%)	Discussed with Prescriber and Patient n(%)	Total Interventions n(%)	Change in Therapy Confirmed n(%)
Add Aspirin	46(16)	14(4.9)	60(20.8)	5(8.3)
Change Diphenhydramine	42(14.6)	12(4.2)	54(18.8)	6(1.1)
Change Promethazine	35(12.2)	13(4.5)	48(16.7)	10(20.8)
Change Oxybutinin	27(9.4)	12(4.2)	39(13.5)	14(35.9)
Change Amitriptyline	29(10.1)	10(3.5)	39(13.5)	26(66.7)
Change Meperidine	8(2.8)	10(3.5)	18(6.3)	15(83.3)
Change Propoxyphene	12(4.2)	18(6.3)	30(10.4)	24(80.0)

All 20 pharmacies reported interventions in hypertension patients. A total of 194 interventions were recorded. The specific intervention, the individuals receiving the recommendation, the total number of each intervention, and the recommendations resulted in a confirmed change in therapy is contained in Table #4.

Sixteen pharmacies (80%) reported interventions in patients with hypertension and diabetes. A total of 152 interventions were recorded. The specific intervention, the individuals receiving the recommendation, the total number of each intervention, and the recommendations resulted in a confirmed change in therapy is contained in Table #5.

Thirteen pharmacies (65%) reported interventions in patients with hypertension and congestive heart failure. A total of 28 interventions were recorded. The specific intervention, the individuals receiving the recommendation, the total number of each intervention, and the recommendations resulted in a confirmed change in therapy is contained in Table #6.

Table #4 Hypertension Interventions

Intervention	Discussed with patient only n(%)	Discussed with Prescriber and Patient n(%)	Total Interventions n(%)	Change in Therapy Confirmed n(%)
Increase Beta Blocker	4(2.1)	10(5.2)	14(7.2)	6(42.9)
Add Beta Blocker	2(1.0)	6(3.1)	8(4.1)	5(62.5)
Increase Diuretic	6(3.1)	10(5.2)	16(8.2)	9(56.3)
Add Duiretic	2(1.0)	4(2.1)	6(3.1)	3(50.0)
Discontinue OTC	70(47)	6(3.1)	76(39.2)	70(92.1)
Change Medication Drug Interaction	10(5.2)	64(3.3)	74(38.1)	54(73)

Table #5 Hypertension and Diabetes Interventions

Intervention	Discussed with patient only n(%)	Discussed with Prescriber and Patient n(%)	Total Interventions n(%)	Change in Therapy Confirmed n(%)
Add/Increase Glucose Monitoring	61(40.1)	35(23.0)	96(63.2)	31(32.3)
Change Medication Drug Interaction	20(13.2)	36(23.7)	56(36.8)	15(26.8)

Table #6 Hypertension and Congestive Heart Failure Interventions

Intervention	Discussed with patient only n(%)	Discussed with Prescriber and Patient n(%)	Total Interventions n(%)	Change in Therapy Confirmed n(%)
Increase Ace Inhibitor	2(7.1)	10(35.7)	12(42.9)	8(66.7)
Add Diuretic	0(0)	2(7.1)	2(7.1)	1(50.0)
Change Medication Drug Interaction	5(1.8)	9(3.2)	14(50.0)	9(64.3)

Discussion

Most of the pharmacies in this project reported interventions in congestive heart failure, diabetes, hypertension, and elderly patients. This research has demonstrated that community pharmacists can review the medication history of their patients and identify situations where the drug therapy does not meet treatment guidelines. Despite their ability to do so, pharmacists did have trouble using pharmacy management systems to search prescription records to identify these cases. Instead they looked for cases while performing activities related to the processing of prescriptions. This prevented the collection of data on the total number of cases that may be eligible for an intervention and thus an analysis of the effectiveness of these activities could not be performed.

Pharmacists did have difficulty in incorporating these activities into their normal work flow. As a result external pressures often limited or prevented pharmacists from performing these activities. Strategies that would assist pharmacists in taking on these responsibilities and incorporating these activities into the work flow of the pharmacy are needed. The limited scope and short duration of this project may have made it more difficult to make these changes. The expansion of community pharmacy practice into non dispensing activities such as the increase in

pharmacist administered vaccines and the delivery of medication therapy management may help pharmacists incorporate these activities into daily practice. The national shortage of pharmacists may have also contributed to this problem. As the shortage decreases, it may make it easier for pharmacies to hire the staff needed to take on additional responsibilities.

There was significant variation in the type of intervention reported by the community pharmacists. Pharmacists were more comfortable making recommendations to change nonprescription medication compared to prescription medication. This may be due to the fact that pharmacists have historically recommended nonprescription products and thus were more comfortable with these products. When the intervention involved a nonprescription product the pharmacist was more likely to discuss it with the patient only as opposed to both the patient and prescriber.

Pharmacists reported more interventions in elderly patients as opposed to any of the other categories. Informal feedback from the community pharmacists revealed that this was due to the fact that additional medical information was not needed to evaluate the drug therapy. Pharmacists felt the Beers Criteria[7] provided clear evidence that the current therapy was less than optimal. In other situations this was less clear and pharmacists were concerned that there may be additional medical information that was not available to them and this information may influence their decision about the current drug therapy. This caused them to be less confident about these recommendations.

Previous research has shown that interventions from community pharmacists intervention can have a positive impact in the treatment of cardiovascular disease[910,11] and diabetes.[12] A literature search revealed no studies of community pharmacists in elderly patients or those with congestive heart failure. This project is the first to report the specific interventions that were provided by the pharmacist as well as the individual(s) they were provided to and the outcome of the activitiy.

Limitations

This goal of this project was to assess the ability of community pharmacists to make interventions that would increase the quality of drug therapy. In many cases a diagnosis was assumed based upon the medication the patient was taking. In addition the adherence to treatment guidelines was used as a proxy for drug therapy quality. This may not be accurate in all cases.

Pharmacists were not randomly chosen to participate in this project. Participating pharmacists had an interest in providing these services prior to this project and are representative of all pharmacists.

Only four categories of interventions were evaluated. This does not represent all possible interventions. The total number of potential interventions was not collected and therefore we do not know how many interventions were missed. The change in therapy as a result of the intervention was reported by the pharmacist. This was not confirmed by consulting an alternative source such as the medical records or the patient or the insurer.

Conclusion

This research demonstrates the ability of community pharmacists to increase the quality of drug therapy by making intervention when the current therapy deviates from treatment guidelines. Pharmacists need additional assistance taking on these responsibilities and incorporating them into their daily workflow. Pharmacists were more comfortable providing interventions in cases where the product was a nonprescription product or when they felt the evaluation did not depend on medical information that was not available to them.

Appendix

Patient Information Form

Patient Identifier		Age (in yrs)		Sex	M or F

Past Medical History (Please list disease state and date diagnosed, if available)	Social/Family History (Smoking status, Alcohol use, Parent/Sibling status)	Recent Hospitalization? (past 6 months)	Y or N
		Multiple Pharmacies Used?	Y or N
		Last MD visit	
		Allergies (Reaction if available)	

Current Rx Medication List (Include drug, dose, frequency)	Current OTC Product use (Include drug, dose, frequency)	Current Herbal Product Use (Include drug, dose, frequency)

Flow Sheet Identification Form

Drug in Patient Profile	Relevant Flow Chart(s)
Beta Blocker Atenolol (Tenormin) Metoprolol Tartrate (Lopressor) Metoprolol Succinate (Toprol-XL) Carvedilol (Coreg) Nadolol (Corgard) Propranolol (Inderal) Pindolol (Visken)	Hypertension Congestive Heart Failure Post MI
ACE Inhibitor Captopril (Capoten) Enalapril (Vasotec) Fosinopril (Monopril) Lisinopril (Prinivil, Zestril) Quinapril (Accupril) Ramipril (Altace) Trandolapril (Mavik)	Hypertension Congestive Heart Failure Post MI
Thaizide Diuretics Hydrochlorothiazide (Hydrodiuril, Esidrix) Metolazone (Zaroxolyn) Chlorthalidone (Hygroton) Indapamide (Lozol)	Hypertension
Loop Diuretics Furosemide (Lasix) Bumetanide (Bumex) Torsemide (Demadex)	Congestive Heart Failure
Statins Fluvastatin (Lescol®) Pravastatin (Pravachol®) Lovastatin (Mevacor®) Simvastatin (Zocor®) Atorvastatin (Lipitor®) Rosuvastatin (Crestor®)	Post MI
Aspirin	Post MI Elderly Patient Interventions
Chlorpropamide (Diabinese)	Diabetes
Metformin (Glucophage)	Diabetes
Spironolactone (Aldactone)	Congestive Heart Failure
Digoxin (Lanoxin, Lanoxicaps)	Congestive Heart Failure
Meperidine (Demerol)	Elderly Patient Interventions
Propoxyphene (Darvocet, Darvon)	Elderly Patient Interventions
Anticholinergic Agents in Elderly (> 60 yrs) Hydroxyzine (Atarax, Vistaril) Diphenhydramine (Benadryl) Promethazine (Phenergan) Oxybutinin (Ditropan) Amitriptyline (Elavil)	Elderly Patient Interventions

Congestive Heart Failure Flow Chart

ACEIs

Who should receive an ACEI?
EVERY CHF patient

Questions to ask patient:

Has patient ever had K+ checked? When?

Has patient had renal function checked?

Is the patient experiencing any side effects?

- Dry cough: 20-25%
- Hyperkalemia
- Angioedema
- Renal dysfunction

Questions to ask Yourself:

Pt not taking ACEI or alternative?

- ARB (Losartan (Cozaar), Valsartan(Diovan) etc..)
- Nitrate + Hydralazine combo

INTERVENTION : Recommend start ACEI

On ACEI but not at target dose?

Drug	CHF Target Dose
Captopril (Capoten)	50 mg TID
Enalapril (Vasotec)	10 mg BID
Fosinopril (Monopril)	10-20 mg QD
Lisinopril (Prinivil, Zestril)	10-20 mg QD
Quinapril (Accupril)	10-20 mg QD
Ramipril (Altace)	5 mg BID

INTERVENTION: ↑ ACEI dose

Are there any Drug Interactions?

- K+ supplements
- Chronic NSAIDs ↓ ACEI effect

INTERVENTION: DC offending agent

Beta Blockers

Who should receive a Beta Blocker?
EVERY stable CHF patient
(on maintenance therapy)

Questions to ask patient:

Is the patient experiencing any side effects?

- Fatigue
- Breathing problems (bronchospasm, esp in pts with history of asthma/COPD)
- Sexual Dysfunction
- Problems related to masking s/s of hypoglycemia

Questions to ask Yourself:

Patient not taking a beta blocker ?

Does pt have an Allergy or Contraindication?
If No:

INTERVENTION: Recommend start Beta Blocker

Drug	Initial CHF Dose
Carvedilol (Coreg)	3.125 mg QD
Metoprolol (Lopressor)	12.5 mg BID
Metoprolol (Toprol-XL)	12.5-25 mg QD

On Beta Blocker but not at target dose?

Drug	CHF Target Dose
Carvedilol (Coreg)	25 mg BID
Metoprolol (Lopressor)	50-100 mg BID
Metoprolol (Toprol-XL)	200 mg QD

INTERVENTION: ↑ BB dose

Are there any Drug Interactions?

- Hypoglycemics: BB's may ↓ efficacy

INTERVENTION: ↑ glucose monitoring

Are there any Drug Interactions?

- Chronic NSAIDs: may ↓ efficacy of BB's

INTERVENTION: DC offending agent

Loop Diuretics

Who should receive a Loop Diuretic?
EVERY CHF pt
(symptomatic relief)

Questions to ask patient:

Has patient ever had K+ checked? When?

Does pt check weight daily?

Is patient experiencing any side effects?

- Dehydration: Fatigue, thirst, dry skin
- Hypotension: Dizziness, lightheadedness
- Hypokalemia: N/V, Headache

Questions to ask Yourself:

Patient not taking a loop diuretic?

Does pt have Allergy or Contraindication?
If No:

INTERVENTION: Recommend start Loop Diuretic

Are there any Drug Interactions?

- Antidiabetics: Loops → hyperglycemia
- Digoxin: Dig toxicity (due to ↓ K+)

INTERVENTION: ↑ monitoring Digoxin levels, ↑ glucose level freq.

Are there any Drug Interactions?

- Chronic NSAIDs: ↓ diuretic effect
- Allopurinol, Colchicine

INTERVENTION: DC offending Agent

Congestive Heart Failure Continued

Additional Drugs to consider for Heart Failure	
Spironolactone (Aldactone)	Digoxin (Lanoxin, Lanoxicaps)
Who should receive this? Every CHF patient in class NYHA III-IV*	Who should receive this? Every CHF patient with EF < 40% (Ask MD) Therapeutic Range = 0.5-1.0 ng/mL
Questions to ask patient:	
Has patient ever had K+ checked? When? If no or >6 months ago:	Has patient ever had dig level checked? When was last time? If no or >6 months ago:
INTERVENTION: Ask MD to check K+ level	**INTERVENTION: Ask MD to check Digoxin level**
	Is patient experiencing any side effects? • Toxicity: vision changes, confusion, N/V, HA
Questions to ask Yourself:	
Patient NYHA Class III or IV and not taking Spironolactone? No Spironolactone Allergy or Contraindication?	**INTERVENTION: Ask MD to check Digoxin level**
INTERVENTION: **Recommend addition of Spironolactone 25-50 mg PO QD**	Questions to ask Yourself:
Are there any Drug Interactions? • Potassium supplements (KDUR, KLOR-CON) • ACEIs: ↑ K+ • Lithium	Are there any Drug Interactions? • Spironolactone, Levothyroxine, Cholestyramine ↓ Dig levels • Amiodarone, Metoprolol/Carvedilol ↑ Digoxin levels
INTERVENTION: **DC potassium supplement** **ACEI: Ask MD to obtain a K+ level and ↑ monitoring** **Lithium: Ask MD to obtain lithium level and ↑ monitoring**	**INTERVENTION: Ask MD to check Digoxin level**

*New York Heart Association (NYHA) Functional Classification of Heart Failure

Class	Description
I	Patients with cardiac disease but without limitations of physical activity. Ordinary physical activity does not cause undue fatigue, dyspnea or palpitation.
II	Patients with cardiac disease that results in slight limitations of physical activity. Ordinary physical activity results in fatigue, palpitation, dyspnea or angina.
III	Patients with cardiac disease that results in marked limitation of physical activity. Although patients are comfortable at rest, less than ordinary activity will lead to symptoms.
IV	Patients with cardiac disease that results in an inability to carry on physical activity without discomfort. Symptoms of HF are present even at rest. With any physical activity, ↑ discomfort is experienced.
Stage	Description
A	High risk (such as HTN, DM) with no structural or functional abnormality and have no s/s
B	No signs or symptoms but have structural heart disease (prior MI)
C	Structural Heart disease with symptoms (past or current)
D	Advanced structural disease with significant symptoms, especially at rest despite medical treatment

Diabetes Flow Chart

Chlorpropamide (Diabinese) Used?

↑ risk of hypoglycemia, especially in elderly patients

INTERVENTION: DC Chlorpropamide

INTERVENTION: Switch to Glipizide (Glucotrol)

Dose conversion

Chlropropamide 250 mg = Glipizide 5-10 mg

Metformin (Glucophage) Used?

Contraindications

Renal Disease/Dysfunction
Scr >1.5 mg/dL in males
Scr >1.4 mg/dL females

- ❑ Heart Failure requiring drug therapy (see CHF flow sheet)
- ❑ Acute or chronic metabolic acidosis, including diabetic ketoacidosis

Warnings/Precautions

- ❑ Elderly: Use with extreme caution
- ❑ Liver Dysfunction

INTERVENTION:
DC Metformin if contraindicated
Switch to alternative agent
Glyburide (Diabeta, Micronase)
Glipizide (Glucotrol)
Repaglinide (Prandin)
Pioglitazone (Actos) if no CHF

Questions to ask Patient:

- ❑ **How often does patient test blood glucose?**
- ❑ **Does patient know last 2-3 readings?**
- ❑ **Does patient know last HgbA1c?**
- ❑ **Has patient ever had renal function tested?**

- ❑ **Does pt experience any of the following? How often?**
  - ❑ **Hypoglycemia**
    - Shakiness.
    - Dizziness.
    - Sweating
    - Hunger.
    - Headache.
    - Pale skin color.
    - Sudden moodiness or behavior changes, such as crying for no apparent reason.
    - Difficulty paying attention, or confusion.
    - Tingling sensations around the mouth.
  - ❑ Hyperglycemia
    - Frequent urination
    - Excessive thirst
    - Extreme hunger
    - Increased fatigue
    - Irritability
    - Blurry vision

Elderly Patient Flow Chart

Aspirin

ASA has been shown to prevent heart attacks and strokes in those with certain risk factors.

Patient post-MI? See post MI sheet

Patient with no history of MI, but age >50 with ≥ 1 of the following:

- ❑ Hypertension
- ❑ Current Smoking
- ❑ Diabetes
- ❑ Hyperlipidemia

No ASA Allergy/Contraindication

Not on Alternative:
Clopidogrel (Plavix)
Warfarin (Coumadin)

INTERVENTION:

ASA 81-325 mg PO QD (Regular or Enteric coated)

Anticholinergic Agents

Elderly at ↑ risk of confusion, urinary retention, constipation, visual disturbance and hypotension.

Offending Agents

Hydroxyzine (Atarax, Vistaril)
Diphenhydramine (Benadryl)
Promethazine (Phenergan)
Oxybutinin (Ditropan)
Amitriptyline (Elavil)

Questions to ask Patient

What product(s) do you use when you get a cold?

Have you ever experienced any of the following symptoms while taking one of the drugs I just mentioned?

- ❑ Urinary retention
- ❑ Constipation
- ❑ Visual changes
- ❑ Confusion

INTERVENTION:
DC Offending Agent
Switch to Alternative Agent

Alternative agents

- ❑ Hydroxyzine, Diphenhydramine, Promethazine
  1. 2nd generation H1 blocker
     1. Loratidine (Claritin)
     2. Fexofenadine (Allegra)
     3. Ceterizine (Zyrtec)
  2. Chlorpheniramine product
- ❑ Oxybutinin → Tolterodine (Detrol)
- ❑ Amitriptyline → SSRI

Narcotics

Many narcotics renally eliminated and cause ↑ mental status changes and ↑ risk of seizures in elderly patients.

Offending Agents

Meperidine (Demerol)

Propoxyphene (Darvon, Darvocet)

INTERVENTION:
DC Offending Agent
Switch to Alternative Agent

Alternative Agents

- ❑ NSAIDs
  - Ibuprofen
- ❑ Codeine/Hydrocodone/Oxycodone
  - Tylenol #3
  - Percocet
  - Vicodin

Hypertension Flow Chart

Uncomplicated HTN	HTN + Diabetes	HTN + CHF
Goal BP < 140/90 mmHg	Goal BP < 130/85 mmHg	
1st Line agents per JNC VII	1st Line agents per JNC VII	

Beta Blockers (BB)	Thiazide Diuretics	ACEIs
Atenolol (Tenormin) Metoprolol Tartrate (Lopressor) Metoprolol Succinate (Toprol-XL) Carvedilol (Coreg) Propranolol (Inderal) Nadolol (Corgard) Pindolol (Visken)	Hydrochlorothiazide (Hydrodiuril, Esidrix) Metolazone (Zaroxolyn) Chlorthalidone (Hygroton) Indapamide (Lozol)	Captopril (Capoten) Enalapril (Vasotec) Fosinopril (Monopril) Ramipril (Altace) Quinapril (Accupril) Trandolapril (Mavik) Lisinopril (Prinivil, Zestril)
Questions to ask patient:		
Does patient know last BP? Can you take it in the pharmacy?		
BB questions to ask patient:	Diuretic questions to ask patient:	ACEI questions to ask patient:
Is the patient experiencing any side effects? • Fatigue • Breathing problems (bronchospasm, esp in asthma/COPD pts) • Sexual Dysfunction (impotence) • Problems related to masking s/s of hypoglycemia	Has patient ever had K+ checked? When? Is patient experiencing any side effects? • Dehydration: Fatigue, thirst, dry skin • Hypotension: Dizziness, lightheadedness • Hypokalemia: N/V, Headache	Has patient ever had K+ checked? When? Has patient had renal function checked? Is the patient experiencing any side effects? • Dry cough • Hyperkalemia • Angioedema • Renal dysfunction
Questions to ask yourself:		
Pt not on 1st line agent for HTN?		
INTERVENTION: Recommend 1st line agent		
Is pt on 1st Line Agent but BP not at goal?		
INTERVENTION: ↑ BB dose or add diuretic	**INTERVENTION: ↑ Diuretic dose or add BB**	**INTERVENTION: ↑ ACEI dose or add diuretic**
Are there any Drug Interactions?		
• Hypoglycemics: BB's may ↓ efficacy	• Antidiabetics: diuretics → hyperglycemia • Digoxin: may see dig toxicity • Allopurinol, Colchicine	• K+ supplements • Chronic NSAIDs ↓ ACEI effect
INTERVENTION: ↑ glucose monitoring How often does pt check glucose? Do they know last 3-4 readings?	**INTERVENTION: ↑ monitoring • ↑ glucose frequency • Recommend MD get a Dig level • Tell pt to monitor for s/s gout**	**INTERVENTION: DC offending drug Recommend APAP use for aches/pains**
Are there any Drug Interactions? • Pseudoephedrine → ↑ BP • Chronic NSAID: may ↓ efficacy of BB	Are there any Drug Interactions? • Chronic NSAIDs: ↓ diuretic effect	If pt has ACEI allergy or contraindication, is patient taking an ARB?
INTERVENTION: DC offending drug Recommend other cough/cold remedy Recommend APAP use for aches/pains	**INTERVENTION: DC offending drug Recommend APAP use for aches/pains**	Losartan (Cozaar) Valsartan (Diovan) Candesartan (Atacand) Irbesartan (Avapro) Telmisartan (Micardis)

Intervention Form for Congestive Heart Failure

Patient Identifier		Age (in yrs)		Sex	M or F

Diagnosis: Heart Failure	Intervention	Discussed with patient Y or N	Discussed with prescriber Y or N	Change in therapy Confirmed Y or N
	Add Ace Inhibitor			
	Add Beta Blocker			
	Add Diuretic			
	Add Spironolactone			
	Add Digoxin			

Intervention Form for Diabetes, Post MI & Elderly

Patient Identifier		Age (in yrs)		Sex	M or F

Diagnosis: Diabetes	Intervention	Discussed with patient Y or N	Discussed with prescriber Y or N	Change in therapy Confirmed Y or N
	Change Chorpropamide			
	Change Metformin			
POST MI	Additional Interventions	Discussed with patient Y or N	Discussed with prescriber Y or N	Change in therapy Confirmed Y or N
	Add Aspirin			
	Add Statin			
Elderly	Additional Interventions	Discussed with patient Y or N	Discussed with prescriber Y or N	Change in therapy Confirmed Y or N
	Add Aspirin			
	Change Diphenhydramine			
	Change Promethazine			
	Change Oxybutinin			
	Change Amitriptyline			
	Change Meperidine			
	Change Propoxyphene			

Intervention Form Hypertension With or Without Diabetes, Heart Failure

Patient Identifier		Age (in yrs)		Sex	M or F

Diagnosis: Hypertension	Intervention	Discussed with patient Y or N	Discussed with prescriber Y or N	Change in therapy Confirmed Y or N
	Increase Beta Blocker			
	Add Beta Blocker			
	Increase diuretic			
	Add Diuretic			
	Discontinue OTC Due to Possible Interaction			
	Change in Medication Possible Interaction			
HTN + Diabetes	Additional Interventions	Discussed with patient Y or N	Discussed with prescriber Y or N	Change in therapy Confirmed Y or N
	Add or Increase Glucose Monitoring			
	Change in Medication Possible Interaction			
HTN + Heart Failure	Additional Interventions	Discussed with patient Y or N	Discussed with prescriber Y or N	Change in therapy Confirmed Y or N
	Increase Ace Inhibitor			
	Add Diuretic			
	Change in Medication Possible Interaction			

References

1. Knight EL, Avorn J. Quality indicators for appropriate medication use in vulnerable elders. Ann Intern Med. 2001;135:703-710.

2. Pitkala KH, Strandberg TE, Tilvis RS. Innapropriate drug prescribing in home-dwelling, elderly patients. Arch Intern Med. 2002; 162:1707-1712.

3. Hedis and Quality Measurement. National Committee on Quality Assurance. http://www.ncqa.org/tabid/59/Default.aspx

4 . SPSS, Chicago. Available at www.spss.com

5 . Hunt SA, Abraham WT, Casey DE Jr., et al. ACC/AHA 2005 guideline update for the diagnosis and management of chronic heart failure in the adult: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Update the 2001 Guidelines for the Evaluation and Management of Heart Failure). J Am Coll Cardiol. 2005;46:e1– 82.

6 . Standards of medical care in diabetes. American Diabetes Association. Diabetes Care. 2005 Jan;28 Suppl 1:S4-S36

7 . Donna M. Fick; James W. Cooper; William E. Wade; Jennifer L. Waller; J. Ross Maclean; Mark H. Beers. Updating the Beers Criteria for potentially inappropriate medication use in older adults: Results of a US consensus panel of experts. Arch Intern Med. 2003;163(22):2716-2724.

8 . Chobanian AV, Bakris GL, Black HR, et al; Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. National Heart, Lung, and Blood Institute; National High Blood Pressure Education Program Coordinating Committee. Seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure. Hypertension. 2003;42:1206-1252.

9 . Blum BM, McKenney JM, and Cziraky MJ. Pharmaceutical care services and results in Project ImPACT: Hyperlipidema. JAPhA 2000:40(2) 157-165.

10 . Lai LL. Community pharmacy-based hypertension disease-management program in a Latino/Hispanic-American population. The Consultant Pharmacist 2007;22(5)411-416.

11 . Planas LG, Crosby KM, Mitchell KD et al. Evaluation of a Hypertension Medication Therapy Mangement Program in Patients with Diabetes

12 . Berringer R, Shibley MC, Cary CC et al. Outcomes of a community pharmacy-based diabetes monitoring program. JAPhA 1999:39(6)791-797.