

**Pharmacists' Interventions
to Improve Clinical Outcomes and
to Assess Adherence
in a Collaborative Model:
Ambulatory Care Pharmacy Practice**

PATIENT CASE:

RW is a 48 y.o AA female with history of DM and HTN came to clinic. Weight 180lb. BMI 31.9

Vital signs: BP 135/70, P 79, R 24, Temp N

Lab (5-1-2016): A1c10.4%, TG 150, TC 195, LDL 122, HDL 43

Past history for A1c: 12.8% (2-8-2015) & 6.4 (11-4-2015)

Medications: Aspirin 81mg PO QD, Lisinopril 10mg PO QD, Hctz 25mg PO QD, Glipizide 5mg PO BID, Metformin 1000mg PO BID, FESO₄ 325mg PO BID, Multivitamin PO QD

Patient is now experiencing S & S of high blood glucose and is positive for microalbumin level. She was referred to see you for uncontrolled diabetes. What would you do? Is this related to non-adherence of medication or life style modification?

Defines Adherence

- WHO defines adherence as the extent to which a person's behavior in taking medication, following a diet plan, making a healthy lifestyle changes, corresponds with agreed upon recommendations from a health care provider
- Types of Non-Adherence
 - Intentional
 - Unintentional
 - Primary Non-Adherence
 - Secondary Non-Adherence

Estimates Adherence Rates

- 2003 report by WHO showed that
 - Adherence rates to be 50%, which decline significantly after 6 months of therapy
 - Secondary non-Adherence rate may reach up to 75% with some medication after 1-2 years of therapy
 - Secondary non-Adherence rate as follows
 - Diabetes: 28%
 - Hussein Z, Taher SW, Gilcharan Singh HK, Chee Siew Swee W. **“Diabetes Care in Malaysia: Problem, New Models, and Solutions.”** *Ann Glob Health* 81 (6): 851-62, 2015. Prevalence of DM is 20.8%. Affecting 2.8 millions individuals in Malaysia. Non-Adherence is an problem especially on dietary intake.
 - Hypertension : 34%
 - Dyslipidemia: 39%
 - Psychiatric: 30-66%

Pharmacists' Interventions

to improve Clinical Outcomes and to Assess Adherence in a Collaborative Model: Ambulatory Care Pharmacy Practice

- The objective of this study is to evaluate the impact of pharmacists' interventions on clinical outcomes and to assess adherence through an Ambulatory Care Pharmacy Practice
 - Location: Lawndale Medical & Mental Health Service, CA
 - Population Type: An under-represented minority population
 - Practice Setting: Primary care or Ambulatory Care service
 - Practice Model: Collaborative with other healthcare providers
 - Pharmacists' Involvement: 3 Morning (9am-1pm) per week to provide direct patient care

Method

- Eligible patients were age 18 and older, and had diagnosis of chronic diseases and were taking multiple medications were enrolled
- Patients met with pharmacists on a schedule appointment basis through referral by the primary care provider in the clinic
- Pharmacist conducted a Comprehensive Medication Review (CMR) which includes
 - Review of vital signs and laboratory results
 - Review proper and safe use of medications

Method

- Pharmacist's Intervention & Recommendation to Primary Care Providers includes
 - To initiate, to adjust, to modify, or to discontinue drug therapy
 - Ordering laboratory values
 - Drug concentration levels
 - Medication counseling and patient education
 - Referral to specialty treatment
- Follow-up visits were scheduled with pharmacist within 6-to-12-month period until treatment goals were met

Method

- Documentation as Progress Note in SOAP format in the EMR
by the pharmacist
- Demographic, medical conditions and medication utilization data were collected
- Primary and secondary outcomes were collected and analyzed, but not limited to
 - HbA_{1c}
 - BMI
 - Fasting blood glucose levels
 - Blood pressure
 - Lipid panels: TC, TG, LDL, HDL
 - Microalbumin

Method

- Adherence Assessment
 - Adherence Estimator™
 - For new medication
 - Vital Signs and Laboratory results
 - Pharmacist's Appointment
 - Clinic's electronic medical record
 - Pharmacy prescription record

Results

- Thirty (30) patients were seen by the pharmacist

Demographic Data (N=30)	
Race	Hispanic: 74%, African American: 10%, White: 6%, Asian: 9 %, Others:1%
Gender	Male: 8 (26%), Female: 22 (74%)
Age (years)	54.13+/-9.26
Weight (Pounds)	196.70+/-62.17
BMI	33.56+/-10.03
# of Patients using tobacco	6 (16%)
Comorbidities	1 comorbidity: 6 (20%) 2 comorbidities: 16 (53%) 3 comorbidities: 8 (27%)

Results

Medical Conditions (N=30)	
Diabetes Mellitus	30 (100%)
Hypertension	20 (67%)
Dyslipidemia	16 (53%)
Asthma	6 (20%)
Thyroid Disorder	2 (6%)
Atrial Fibrillation	2 (6%)
Neuropathy	6 (20%)
Nephropathy	16 (53%)

Results

Types of Medications Taken by the Patients (N=30)	
Aspirin 81mg	30 (100%)
ACE Inhibitors/ARB	24 (80%)
Lipid-Lowering Drug (Dyslipidemia + DM)	16/16(100%)
Lipid-Lowering Drug (with DM diagnosis)	8/14 (57%)
Oral Diabetic Medications only	
1 medication:	6 (20%)
2 medications:	12 (40%)
3 medications:	2 (7%)
Oral Medication + Insulin Injection	6 (20%)
Insulin Injection only	4 (13%)
Flu Vaccination	12 (40%)
Pneumococcal Vaccination	16 (53%)

Results

Primary or Secondary Outcomes	At Initial Appointment	6-12 Months after Appointment	<i>P-Value</i>
Primary outcomes HbA _{1c} (%)	9.85+/- 2.94	7.55+/-1.79	< 0.05
Secondary Outcomes			
FBG (mg/dl)	218.50+/-100.50	142.40+/-23.48	< 0.05
TG (mg/dl)	203.40+/-37.13	147.90+/-30.21	< 0.05
TC (mg/dl)	188.40+/-56.99	149.10+/-41.35	NS
LDL (mg/dl)	138.90+/-31.13	95.86+/-23.13	< 0.05
HDL (mg/dl)	48.57+/-17.15	46.00+/-11.60	NS
Systolic BP (mmHg)	144.50+/-17.46	130.80+/-13.35	NS
Diastolic BP (mmHg)	79.00+/-11.41	71.25+/-3.53	< 0.05

NS=Not significant

Conclusion

- The data showed that pharmacists can play an important and effective role in providing direct patient care to improve clinical endpoints in an ambulatory care setting in collaborating with other primary health care providers
- Limitations
 - Small sample size
 - No controlled group
 - Robust adherence studies on Sustained Medication Adherence approach are critical to re-define pharmacists' role in ambulatory care practice using multi-regressive analysis

Thank You!

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