ประสิทธิผลของเภสัชกรเยี่ยมบ้านในการดูแลผู้ป่วยโรคเบาหวาน ประเภท 2 ในชุมชน เขตกรุงเทพมหานคร

นางศิริรัตน์ ตันปิชาติ

วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาวิทยาศาสตรดุษฎีบัณฑิต
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EFFECTIVENESS OF PHARMACIST HOME HEALTH CARE FOR TYPE 2 DIABETES IN BANGKOK METROPOLITAN: A COMMUNITY BASED STUDY

Mrs. Sirirat Tunpichart

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ศิริรัตน์ ตันปิชาติ: ประสิทธิผลของเภสัชกรเยี่ยมบ้านในการดูแลผู้ป่วยโรคเบาหวาน ประเภท 2 ในชุมชน เขตกรุงเทพมหานคร (EFFECTIVENESS OF PHARMACIST HOME HEALTH CARE FOR TYPE 2 DIABETES IN BANGKOK METROPOLITAN: A COMMUNITY BASED STUDY) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ผู้ช่วยศาสตราจารย์ ภญ. ดร. รุ่งพีชร สกุลบำรุงศิลป์, อ.ที่ปรึกษาวิทยานิพนธ์ร่วม: ผู้ช่วยศาสตราจารย์ ดร.รัตนาสำโรงทอง, ดร.ดวงทิพย์ หงษ์สมุทร, 203 หน้า

ความเป็นมา: โรคเบาหวานเป็นโรคเรื้อรังที่พบมากในประเทศไทย ซึ่งก่อปัญหาภาวะโรคแทรกซ้อนและอัตราการตายเพิ่มขึ้นทุกปี จากรายงานสำรวจสุขภาพประชาชนไทยพบว่าผู้ป่วยเบาหวานในกรุงเทพมหานครที่ได้รับการรักษา 42.8%ที่ไม่สามารถควบคุมภาวะน้ำตาลในเลือดได้ (วิชัย เอกพลากร,2552) โรคเบาหวานมีความสัมพันธ์กับภาวะเสี่ยงของโรคร่วมซึ่งต้อง ใช้ยาหลายรายการในการรักษา จึงทำให้ผู้ป่วยโรคเบาหวานมีโอกาสเกิดปัญหาจากการใช้ยาและส่งผลต่อการควบคุมโรค จุดประสงค์ของการศึกษาในครั้งนี้ เพื่อประเมินประสิทธิผลของเภสัชกรชุมชนเยี่ยมบ้านในการดูแลผู้ป่วยโรคเบาหวานในชุมชน เขตกรุงเทพมหานคร ซึ่งเภสัชกรชุมชนนำรูปแบบการจัดการด้านยา (Medication Therapy Management: MTM) มาให้บริการเพื่อค้นหาปัญหาจากการใช้ยาของผู้ป่วยเบาหวาน

วิธีการศึกษา: การวิจัยนี้เป็นวิจัยแบบเชิงปฏิบัติการ (Action research) มีการศึกษาก่อนและหลังการจากการให้บริการเยี่ยมบ้านโดยเภสัชกร ทีมพยาบาลเยี่ยมบ้านของศูนย์บริการสาธารณสุข กรุงเทพมหานคร 68 แห่ง เป็นผู้คัดเลือกกลุ่มตัวอย่างผู้ป่วยเบาหวานที่ควบคุมอาการไม่ได้และมีความเสี่ยงที่อาจเกิดปัญหาจากการใช้ยา โดยการส่งรายชื่อและข้อมูลจำนวน 34 ชุมชน ให้กับเภสัชกรชุมชนในร้านยา 3 แห่ง เภสัชกรชุมชนให้การดูแลผู้ป่วยโดยใช้รูปแบบการจัดการด้านยา (MTM) เพื่อการเยี่ยมดูแลที่บ้าน จำนวน 3 ครั้ง และ เพื่อติดตามประเมินผล อีก 2 ครั้ง ในระยะเวลา 6 เดือน การเยี่ยมบ้านแต่ละครั้งใช้เวลาประมาณ 60 นาทีต่อผู้ป่วย 1 คน โดย 20 นาที ซักถามประวัติข้อมูลจากผู้ป่วยและผู้ดูแลและ 40 นาทีในการจัดทำข้อมูลการใช้ยา ลงบันทึกเอกสาร จัดทำเอกสารเพื่อส่งต่อแพทย์ที่ให้การรักษา และ แก้ปัญหา พร้อมคำอธิบายเรื่องโรค ยา อาหาร

ผลการศึกษา: กลุ่มตัวอย่าง 288 คน มีอายุเฉลี่ย 66±9.4 ปี เป็นเพศหญิง 75.3% มีโรคความดันโลหิตสูงเป็นโรคร่วม 81.7% และ มีโรคร่วมมากกว่า 2 โรคขึ้นไปถึงร้อยละ 90 มีการรับประทานยาโดยเฉลี่ย 7.1 ± 3 รายการและร้อยละ 89.3 มีรายการยามากกว่า 4 รายการขึ้นไป จากการเยี่ยมโดยเภสัชกรพบปัญหาจากการใช้ยาทั้งหมด 858 ปัญหา คิดเป็น 2.98 ปัญหาต่อผู้ป่วย 1 คน เป็นปัญหาจากไม่ให้ความร่วมมือในด้านยา (non-adherence) 822 ปัญหา คิดเป็นร้อยละ 95 จากปัญหาทั้งหมด ปัญหาทางด้านคลินิค 134 คนมีอาการชาปลายมือ ปลายเท้าจากโรคเบาหวาน ผู้ป่วยในชุมชนมีปัญหาจากพฤติกรรม การบริโภคอาหาร การออกกำลังกาย จากการเยี่ยมบ้าน 3 ครั้งโดยเภสัชกรชุมชน พบว่า ปัญหาจากไม่ให้ความร่วมมือในด้านยามีการเปลี่ยนแปลงเป็นร้อยละ 18.2 ในกลุ่มร่วมมือ และ ร้อยละ 26 กลุ่มให้ความร่วมมือบ้าง ผลการเปลี่ยนแปลงระดับน้ำตาลในเลือดดีขึ้นร้อยละ 3.38 ในกลุ่มที่มีระดับน้ำตาล มากกว่า 126 มก./ดล. ในขณะที่ระดับความดันโลหิตสูงของกลุ่มความดันโลหิตระดับความรุนแรงขั้นที่ 2 (Stage II ≥160/≥ 100) เปลี่ยนเป็นกลุ่มที่มีระดับความรุนแรงน้อยกว่าร้อยละ 56.1 นอกจากนี้เภสัชกรเยี่ยมบ้านได้ส่งผู้ป่วยกลับแพทย์ผู้รักษาจำนวน 34 คน และ ได้รับการตอบสนองจากแพทย์ ร้อยละ 55 หรือ 19 คน พร้อมได้รับการแก้ปัญหาจากคำแสนอแนะของเภสัชกรเยี่ยมบ้าน

สรุป: การศึกษาพบว่า การดูแลผู้ป่วยโดยเภสัชกรชุมชนเยี่ยมบ้านสามารถช่วยลดปัญหาที่อาจจะเกิดจากการใช้ยาพร้อมกับเพิ่มคุณภาพการดูแลผู้ป่วย การประสานความร่วมมือระหว่างหน่วยบริการปฐมภูมิและเภสัชกรชุมชนย่อมก่อประโยชน์สูงสุด จึงเห็นสมควรการขยายรูปแบบเภสัชกรชุมชนเยี่ยมบ้านทั่วประเทศ

นโยบาย: รูปแบบการบริการของเภสัชกรชุมชนยังไม่อยู่ในระบบประกันสุขภาพของประเทศ อย่างไรก็ตามการจัดการด้านยา (MTM) โดยเภสัชกรชุมชนเป็นประโยชน์ต่อการเพิ่มคุณภาพการใช้ยาของผู้ป่วยโรคเรื้อรังซึ่งควรอยู่ในชุดสิทธิประโยชน์ของผู้ป่วย โดยการผสมผสานรูปแบบการบริการของเภสัชกรชุมชนเป็นส่วนหนึ่งของการดูแลผู้ป่วยในระบบสาธารณสุข จะช่วยก่อประโยชน์การใช้ยาอย่างเหมาะสมเพื่อเพิ่มประสิทธิภาพการใช้ยาในการรักษาโรค

สาขาวิชา วิจัยเพื่อการพัฒนาสุขภาพ ลายมือชื่อนิสิต .....

ปีการศึกษา 2553 ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์หลัก .....

ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์ร่วม .....

ลายมือชื่อ อ.ที่ปรึกษาวิทยานิพนธ์ร่วม .....

4989694220: MAJOR RESEARCH FOR HEALTH DEVELOPMENT

KEYWORDS: COMMUNITY PHARMACISTS, HOME HEALTH CARE, MEDICATION THERAPY MANAGEMENT (MTM), DRUG RELATED PROBLEMS (DRPs), PATIENT ADHERENCE

SIRIRAT TUNPICHART: EFFECTIVENESS OF PHARMACIST HOME HEALTH CARE FOR TYPE 2 DIABETES IN BANGKOK METROPOLITAN: A COMMUNITY BASED STUDY. ADVISOR: ASSISTANT PROFESSOR RUNGPETCH SAKULBUMRUNGSIL, Ph.D., CO-ADVISOR: ASSISTANT PROFESSOR RATANA SOMRONGTHONG, Ph.D., DUANGTIP HONGSAMOOT, Dr.P.H., 203 pp.

Background: The diabetes was common chronic disease in Thailand with increasing burdens of morbidity and mortality. There were 42.8% of diabetes patients in Bangkok who had been treated but disease conditions were uncontrolled (Aekplakorn, 2009). The diabetes was associated with metabolic risk of co-morbidities and treated with polypharmacy. Consequently, diabetes with the drug related problems (DRPs) frequently occur, leading to problems on disease controlled. The objective of this study was to assess the effectiveness of community pharmacist home health care for diabetic patients in community-based Bangkok Metropolis. The community pharmacists were required to indentify the drug related problems of diabetes by using medication therapy management (MTM) as the service template.

Methods: This study was an action research using one group before-and-after. The Thirty-four communities out of 68 Bangkok Metropolitan Health Centers were participating in referring uncontrolled diabetic patients to 3 community pharmacy settings for home health care visits. The study populations were 288 uncontrolled diabetic patients with high prevalence of drug related problems were purposively identified by nurses from primary care units during their regular home health visits and referred to community pharmacists. Three pharmacist home health care interventions using MTM services were planned over the 6-month period. Two additional pharmacist home visits were also conducted for outcome assessment. The average time spent by the pharmacist on each patient was approximately 60 minutes of which 20 minutes were spent on patient and/or caregiver interview and medication review and 40 minutes on intervention, patient medication record, documentation, and referral if needed.

Results: The mean (SD) age of 288 patients was 66.0 (9.4) years and 75.3% were female of 288 patients. Hypertension was the main co-morbidity found in 81.7% of patients, and 90% with two or more diseases. They were taking on the average (SD) of 7.1 (3) medications and 89.3% of patients had 4 or more medications. A total of 858 drug related problems or 2.98 problems per patient were identified by registered community pharmacist. Among these, 822 or 95% were non-adherence. The peripheral neuropathy was the major clinical symptoms detected in 134 of patients. Inappropriate eating behavior and lack of exercise were life- style problems. After 3 interventions, non-adherence level was changed to adherent level and partial adherent by 18.2%, 26%, respectively. Fasting blood glucose level > 126 mg/dL was improved in 3.38% of patients, while blood pressure level was improved in 56.1% of patients by changing from hypertension stage II to lower stage. Out of 34 cases referred to physicians, 55% or 19 cases had their medications altered as recommended by community pharmacists.

Conclusion: This study concluded that community pharmacist home health care could alleviate patients' medication utilization problems and would thus improve overall quality of patient care. The integrated care among primary care units and community pharmacists would be recommended to extend to other provinces and at a larger scale.

Policy: Community pharmacy services have not been a part of universal health coverage. However, Medication Therapy Management (MTM) for chronic conditions provided by pharmacists, cover improve quality of patient medication utilization, and they should be included as a part of benefit package for patients. Integrating community pharmacy services as a part of health benefit scheme would improve patient medication utilization and in turn improving patient outcomes.

Field of Study : Research for Health Development

Academic Year : 2010

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LIST OF ABBREVIATIONS

ADRs	: Adverse Drug Reactions
APhA	: American Pharmacists Association
ASHP	: American Society of Health System Pharmacist
BMA	: Bangkok Metropolitan Administrative
CCM	: Chronic Care Model
CHF	: Congestive Heart Failure
CPA	: Community Pharmacy Association (Thailand)
CV	: Cardiovascular or Cerebrovascular
DALY	: Disability-Adjusted Life Year
DQOL	: Diabetes Quality of Life
DRPS	: Drug Related Problems
ECHO	: Economic Clinical Humanistic Outcome
ECA	: Estimated Cost Avoidance
FPG	: Fasting Plasma Glucose
HbA1c	: Hemoglobin A1C
MAP	: Medication Action Plan
MPR	: Personal Medication Record
MTM	: Medication Therapy Management
MTR	: Medication Therapy Review
NACDS	: National Association of Chain Drug Stores
NHSO	: National Health Security Office
PHM	: Patient Health Monitoring Book or Patient Record Book
PHP	: Patient Health Profile
PKA	: Patient Knowledge Assessment
PMA	: Patient Medication Questionnaire Assessment
RCP	: Registered Pharmacist Counseling Profile
RMP	: Registered Pharmacist Medication Profile
RRA	: Registered Pharmacist Referral Assessment
RSP	: Registered Pharmacist Screening Profile
WHO	: World Health Organization

CHAPTER I

INTRODUCTION

BACKGROUND AND PROBLEMS

Diabetes mellitus is a chronic disease that occurs in people around the world, and the trend of the incidence rate has increased over time (Unger, 1998; Kretowski, 2001). For all groups worldwide, the prevalence of diabetes was estimated at 2.8% in 2000 and 4.4% in 2030 (Wild, 2004). Diabetes mellitus (diabetes) accounts for a huge burden of morbidity and mortality through micro- and macro-vascular complications such as kidney diseases and nerve damage (Garcia et al., 1974). The co-morbidities (e.g., hypertension and dyslipidemia) and diabetes-related complications (e.g., nephropathy, neuropathy, retinopathy, coronary artery disease, cardiovascular disease, and peripheral vascular disease) were associated with an increase in health care costs and hospitalization.

In Thailand, diabetes is a common chronic disease with increasing burdens. Diabetes is ranked the fifth and the third of the top 10 diseases among males and females, respectively, based on disability-adjusted life-years in 1999. The diabetes prevalence had risen from 2.3% in 1991 to 4.6% in 1996 and 6.9% or 3.2 million individuals in 2004 (Ministry of Public Health., 2004). The prevalence of diabetes in Thai adults aged 35 years or older rose to 9.6% during the year 2000 and Diabetes frequently affects the population aged 45 years and older (Wichai Aekplakorn et al., 2003). Furthermore, the patients who were receiving treatment but uncontrolled were 42.8% in Bangkok, and 31.5%, 41.1% in male and female in 2009, respectively (Wichai Aekplakorn, 2009). The number of deaths from diabetes had risen more than four-fold in the past 30 years with the number of associated hospital admissions of diabetes had also risen from 33.3 per 100,000 population in 1985 to 91.0 in 1994 and

586.8 in 2006. The rates of mortality among diabetes had also risen from 28.8 in 1996 to 71.3 per 100,000 populations in 2006 (Suwit Wibulpolprasert, 2007).

The fundamental role of the diabetes multidisciplinary professional management team is the development of initiatives to help people with diabetes to achieve glucose level goals and to reduce the risk of complications. In recent years, the team structure has changed in many healthcare systems to reflect changes in the model of care (McGill and Felton, 2007) and the services for consistency with continuity of care for diabetes. The Chronic Care Model (CCM) was a guide to higher-quality chronic illness management that brought new conceptual frameworks and innovations for redesigning the healthcare setting. The empirical work on the CCM thus far had focused on the management of chronic illnesses such as diabetes, cardiovascular disease, hypertension (Bodenheimer, T., Wagner, E H., and Grumbach, K, 2002; Pearson et al., 2005, Mangione et al., 2005, Parchman et al., 2007, Nutting et al., 2007). The model has also been explored preliminarily a template for prevention and for the delivery of services that address health risk behaviors (Glasgow et al., 2001; Hung et al., 2007). Furthermore, the delivery of home health care service may benefit mostly to the elderly and disabled patients with chronic medical conditions (e.g. coronary heart disease, diabetes, congestive heart failure, asthma, and chronic obstructive pulmonary disease). Other home care providers can also identify patients who live alone or are confined to their home. Elderly persons who take many medications and those with poor cognition may benefit from pharmacist's home health care within a week of being discharged from hospital (Stewart et al., 1988). The home health care service in Bangkok was mainly responsible by nurse team which were not covered the drug related problems (DRPs), the emergency problems due to polypharmacy. Besides, the chronic patients have been increasing so that home health care service cannot be delivered to all needed patients. In 2006-2007, the report of coverage of home health care in Bangkok Metropolitan achieved only 35% (17,350 from 50,137 times) for 5,768,080 populations (National Health Security Office [NHSO], 2008).

Typically, polypharmacy and multidrug regimens are required to control hyperglycemia and the associated metabolic risk factors of hypertension and

hyperlipidemia (Grant et al., 2002). The strict controls of blood glucose in Type 2 diabetes reduces the risk and delays the onset of complications of diabetes, and brings improvements in overall patient quality of life. The management of diabetes is a complex, lifelong process requiring a great deal of effort on the part of the patients. The patients, rather than any health care providers, are the key to successful management.

Polypharmacy was the natural consequence of providing evidence-based medical care to patients with type 2 diabetes (American Diabetes Association [ADA], 2004) and showed a dramatically increase in the risk of experiencing an adverse drug event (Chrischilles Segar, T., and Wallace, R., 1992; Hanlon et al.,1996). Drug related problems were frequent among patients discharged from hospital that events or circumstances involving drug therapy that actually or potentially interfere with desired health outcomes. Factors that increase the risk of DRPs were polypharmacy, co-morbidity, aging, non-adherence and lack of coordination between different treating physicians. The causes for these problems were prescription errors, non-compliance with treatment and the specific effects of drugs in patients (Hepler and Strand, 1990).

One strategy for reducing drug related problems from polypharmacy is comprehensive medication therapy management (MTM) services by pharmacists. Pharmacist in MTM model offers as an all-encompassing model that incorporates the philosophy of pharmaceutical care, techniques of patient counseling, and disease management in an environment that facilitates the direct collaboration of patients, pharmacists, and other health professionals. Pharmacy services are essential to the delineation of a viable and sustainable practice model for pharmacists. MTM program leaded to a reduction in overall health care expenditures by optimizing therapeutic outcomes, especially in elderly patients (American Pharmacists Association and the National Association of Chain Drug Stores Foundation., 2008).

Furthermore, the chronic care model for diabetes in Thailand was delivered mainly in secondary, tertiary hospital settings. The primary health care embraced a holistic view of health the continuity of care from hospital to home was limited.

Improvement of community and home-based diabetes care programs was needed to increase the service of home health care. Home health care for diabetes care was very essential due to the fact that the number of patients and drug related problems that have been increasing every year particularly in Thailand. The home health care services were not completed the system and process for diabetes services at home. However, the home health care services had nurses as the main for the visits that were lack of pharmacists in care team. The pharmacist home health care service methods were limited. Therefore, this study was integrated the MTM services by pharmacist home health care as the delivery design of care that was the element in practice level of chronic care model. This delivery of care could reduce drug-related problems and improve diabetes patients' quality of life. Furthermore, the expenditures of drug cost can decrease by medication utilization, optimize of therapeutic outcomes, and reduction in overall health care. The community pharmacists provide the medication therapy management services should be included as a part of benefit package for patients.

RESEARCH QUESTION

Could the pharmacist home care improve care of diabetes patients in term of clinical, humanistic, and economic outcomes (ECHO Model) in community-based in Bangkok Metropolis?

OBJECTIVES

General Objective

To assess the effectiveness of pharmacist home health care for diabetic patients in community-based Bangkok Metropolis.

Specific Objectives

1. To assess the pharmacist home health care practice.
2. To evaluate clinical outcomes on fasting plasma glucose level, hypertension outcomes.

3. To assess adherence rate in diabetic patients receiving pharmacist home health care.
4. To detect drug related problems (DRPs).
5. To assess the satisfaction and the quality of life as humanistic outcomes.
6. To assess the economic outcome in term of excessive drug cost.

HYPOTHSIS

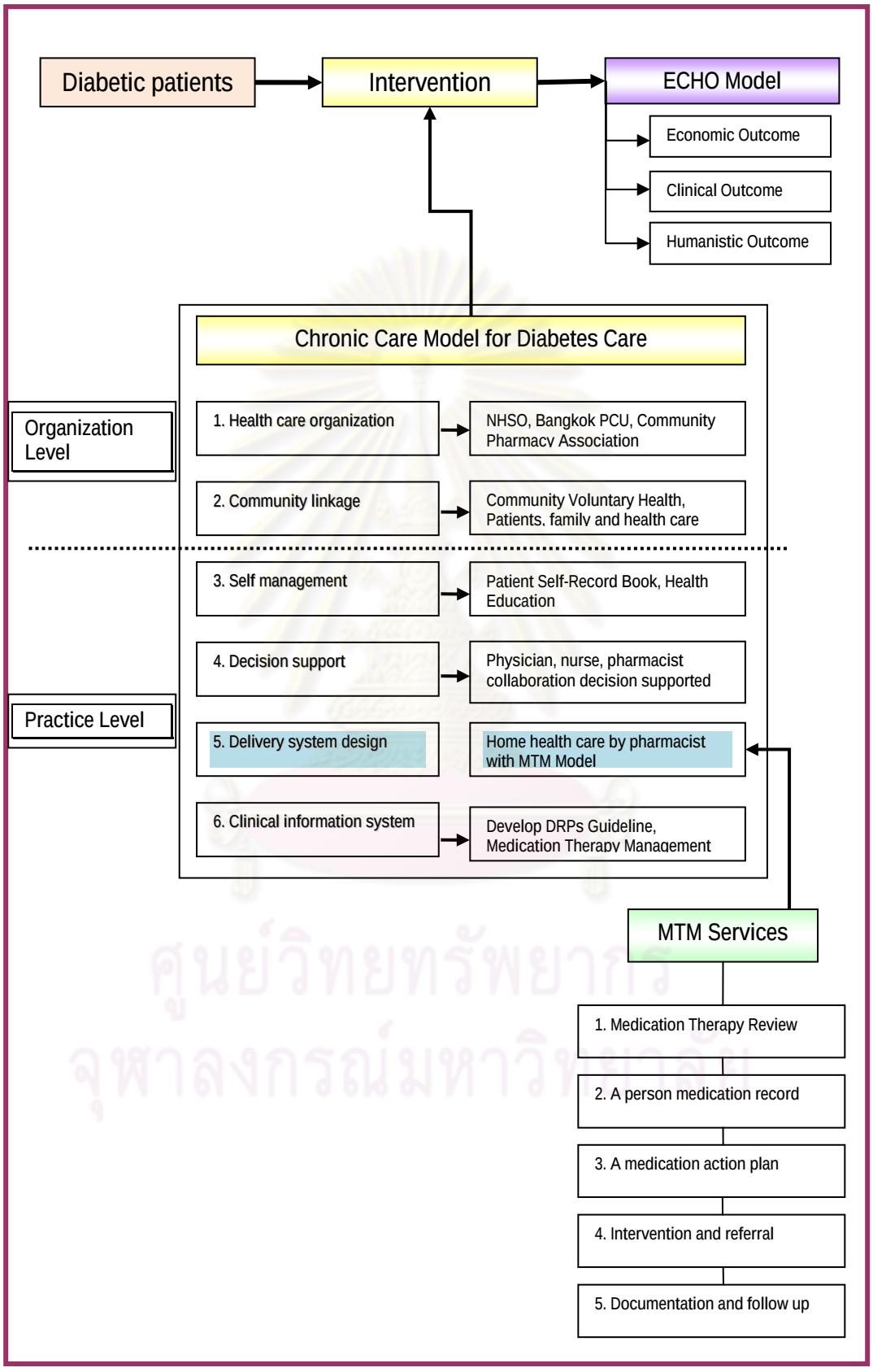
The pharmacist home health care can improve care of diabetic patients in term of clinical, humanistic, and economic outcomes (ECHO Model) in community-based in Bangkok Metropolis.

CONCEPTUAL FRAMEWORK

Chronic Care Model (CCM) is an intervention implemented for primary care of chronic illness; diabetes. It consisted of 6 essential elements classified into 2 parts; the first part concerned health care organization, the community resources and policies. The other parts are practice level that includes supportively system i.e. decision support, clinical information systems and service system i.e. self-management support, and delivery system design involves three components: the formation of primary care teams, care management, and planned chronic care visits. In this study, the service designs are the medication therapy management (MTM) service by home health care.

The medication therapy management (MTM) service is a part of delivery system design in the CCM that used for providing safety medication and continuity of care. There are five cores in MTM services to improve health care which consists of medication therapy review, a personal medication record, a medication action plan, intervention, referral, documentation, and follow-up. The focus of MTM was on individual patient, with the intention of optimizing the patient's drug regimen to achieve therapeutic goals. The outcomes is evaluate in economic outcomes, clinical outcomes and humanistic outcomes that known as ECHO Model.

Figure 1: Conceptual Framework



Definition of Terms

Adherence (compliance): is a medical term that is used to indicate a patient's correct following of medical advice. Most commonly it is the correctness of patient taking medication (drug compliance). The patients assume collaboration between the patient and the health care provider regarding the patient's health care and health-related decisions. The most effective way for a physician to improve patient compliance is through a positive physician-patient relationship.

Adherence rate: are usually reported as the percentage of the prescribed doses of the medication actually taken by the patient over a specified period. The adherence rate includes data on dose taking (taking the prescribed number of pills each day) and the timing of doses (taking pills within a prescribed period).

Drug Related Problems (DRPs): problems which are classified under eight headings: untreated indication, improper drug selection, sub-therapeutic dosage, over-dosage, adverse drug reaction, drug interaction, invalid indication and, non-compliance.

Effectiveness: An evaluation of the extent to which an existing (tested) intervention with documented internal validity produced a change in outcome rate and health a behavioral impact.

Home Health Care: The health service provided to patient and her or his family within the home environment. The service is a wide range of community-based services to support someone that is recuperating from an acute situation, or services needed by persons with on-going chronic conditions, such as diabetes, stroke, and cerebral palsy. The goal of home health care is to provide treatment for the illness or injury to patients as better health.

Medication Therapy Management (MTM): A structure of provide pharmaceutical care that services or programs are furnished by a qualified pharmacist to an eligible beneficiary, individually or on behalf of a pharmacy provider, which are designated to ensure that medications are used appropriately by such individual, enhance the

individual's understanding of the appropriate use of medications, increase the individual's adherence with prescription medication regimens, reduce the risk of potential adverse events associated with medications, and reduce the need for other costly medical services through better management of medication therapy.

Polypharmacy: is the use of multiple medications by a patient, especially when too many forms of medication are used by a patient, when more drugs are prescribed than is clinically warranted, or even when all prescribed medications are clinically indicated but there are too many pills to take (pill burden). The most common results of polypharmacy are increased adverse drug reactions, drug-drug interactions and higher costs. Polypharmacy is most common in people with multiple medical conditions.

THE STUDY APPROACH

The study approach consists of three phases, the first phase was the preparatory phase; during which tools were developed, and pharmacists were trained. The health professionals (nurses) were coordinated. Conventions and tools and for guideline for each element of Medication Therapy Management (MTM) were developed. Guidelines were seen as standard operatively procedure for community pharmacists and used to facilitate communication in providing patient education on diseases, medication, and nutrition. Community pharmacists providing home health care were prepared and standardized through training program, including the basic knowledge on diabetic therapy, updated medication therapy for diabetes, MTM concepts and service, instrument and documentation, and have health care procedures. The coordination with nurse home health care team and voluntary health villages were invited so patients were identified and the communities.

The second phase was service provision. The community pharmacist home health care team visited patient homes to provide MTM services. Each patient received continuous medication monitoring 3 times with approximately 1 to 3 months internal. The final phase was outcome measurement. Each patient was followed up

with 2 more home visits for health outcome evaluation using ECHO model; economic, clinical, and humanistic outcomes.

EXPECTED BENEFIT AND APPLICATION

1. The pharmacist home health care service should be able to help diabetes patients to improve health outcome.
2. The continuity of care by pharmacist might increase the medication adherence.
3. The medication therapy management service by pharmacists can optimize the drug safety and drug related problems management.
4. The chronic care model (CCM) and medication therapy management (MTM) can apply and provide to improving primary care for patients with diabetes.

CHAPTER II

LITERATURE REVIEW

The chapter reviewed issue the related the main topics in order to the design the appropriated roles of pharmacist for this study.

I. Chronic Care Model for Diabetes Care
II. Drug Related Problems (DRPs)
III. Medication Therapy Management Model (MTM Model)
IV. Home Health Care

I. Chronic Care Model for Diabetes Care

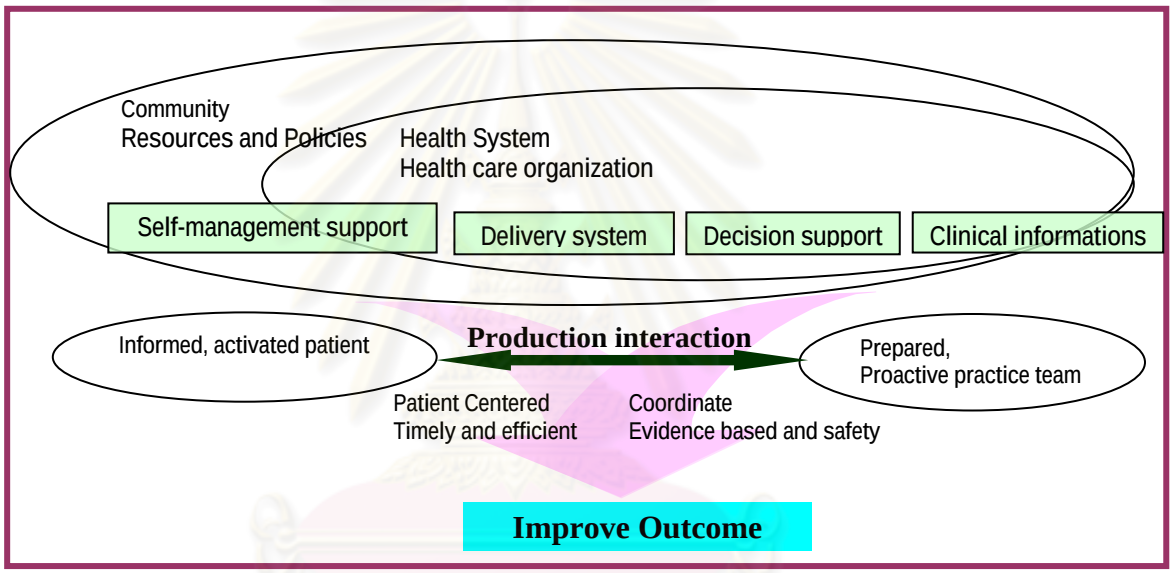
I.1 Chronic Care Model

The Chronic Care Model according to Wagner, known for in successful chronic-illness care improvement, derived from the early 1990s work by the Group Health Cooperative of Puget Sound MacColl Institute for Healthcare Innovation. The Chronic Care Model [CCM], 1998) has been applied to a variety of chronic illnesses, health care settings, and target populations. It has been adopted increasingly widely as a tool for transforming health care systems, not only nationally but also internationally, through collaboration with the World Health Organization [WHO].

The Chronic model care (Figure2) (Wagner, Davis, Schaefer, Von Korff, and Austin, 1999) had taken place within 3 overlapping galaxies: (1) the entire community, with its myriad resources and numerous public and private policies; (2) the health care system, including its payment structures; and (3) the provider organization, whether an integrated delivery system, a small clinic, or a loose network of physician practices. The heart of the CCM was predicated upon the creation of the fundamental care unit: a prepared, proactive practice team delivering care to an

informed, active patient. This prepared, proactive practice team uses evidence-based clinical information, was prepared with patient-specific data before each visit, and each team member was empowered by having designated roles to contribute to the patient experience and optimized outcome. The informed, activated patient (included family and/or caregiver) understood their conditions, was confident of his self-management skills, and knows what to expect from health care system.

Figure 2: The Chronic Care Model.
Adapted with permission of Effective Clinical Practice



Resource: MacColl Institute for healthcare Innovation

The chronic care model (CCM) is a comprehensive framework featuring six elements for quality improvement (Bodenheimer & Grumbach, 2007).

1.1. Health care organization/organization of healthcare.

This element provides the structural foundation (philosophically and literally) on which the remaining 4 components of the CCM relies on (Figure 2). Understanding the mission, goals, and values of the provider organization and its relationship with purchasers, insurers, and health care providers is the key to successful CCM implementation (O'Connor, Sperl-Hillen, Pronk, and Murray, 2001).

1.2. Community resources and policies.

Communities provide individuals with diabetes, their caregivers, friends, and employers with a variety of ancillary services that provide support for diabetes self-management. Policies define relationships within a community between various agencies (e.g. networks, how services are accessed and provided, etc). Policies are also important for reimbursement and sustainability.

1.3. Decision support.

Decision support uses specialist expertise to establish evidence-based clinical practice guidelines, standards, and protocols. Use of these evidence based tools can be facilitated through provider education and support programs.

1.4. Self-management support.

This element engages the patient in the active self-management of his or her illness. When informed patients take an active role in managing their disease and providers are prepared, proactive, and supported with time and resources, their interaction is likely to be productive. The goal is to customize care to engage the patient in setting goals that change their behavior to self-manage their diabetes goal.

1.5. Clinical information systems.

These systems are necessary for collecting and housing timely, useful data about individual patients and populations of patients, using tools such as patient registries and care reminders. The information system allows quality measures to be assessed and care evaluated, providing ongoing feedback to the provider and patient.

1.6. Delivery system design.

This element defines team roles and delegates tasks. Planned management ensures continuity of care and regular follow-up through redesigning how care is delivered.

Chronic care model is also a useful construct for improving clinical preventive services, including both screening and counseling for health behavior change. Chronic care model 4 components such as self-management support, delivery system design, decision support and clinical information system. The self-management support

involves collaboratively helping patients and their families acquire the skills and confidence to manage their chronic illness; proving the management tools (e.g., blood pressure monitor and referrals to community resources.

Delivery system design involves three components: the formation of primary care teams, case management and planned chronic care visit. The essential element of delivery system redesign is planned care, that multidisciplinary teams are needed to conduct planned care. The evidence-based clinical practice guideline provides standards for optimal decision support for chronic care. The CCM strives to foster more productive interactions between prepared, proactive practice teams and well-informed, motivated patients (MacColl Institute for healthcare Innovation., 2009).

I.2 Diabetes mellitus

Diabetes mellitus (diabetes) is a syndrome of disordered metabolism, usually due to a combination of hereditary and environmental causes, resulting in abnormal high blood sugar levels (hyperglycemia). Diabetes mellitus type 2 or type 2 diabetes (formerly called non-insulin-dependent diabetes mellitus (NIDDM), or adult-onset diabetes) is a metabolic disorder that is characterized by high blood glucose in the context of insulin resistance and relative insulin deficiency. This leads to substantially increased morbidity and mortality in both type 1 and type 2 patients, but the two have quite different origins and treatments despite the similarity in complications. Diabetes-related complications were classified as microvascular complication included nervous system damage (neuropathy), renal system damage (nephropathy) and eye damage (retinopathy), or macrovascular complication included cardiovascular disease, stroke and peripheral vascular disease (American Diabetes Association, 2006; UK Prospective Diabetes Study Group., 1998). There were several risk factors that increase the risk for dying in people with diabetes.

Diabetes is the seventh leading cause of death in the United States (U.S. Department of Health and Human Services, 1998). Mortality is primarily related to heart disease: adults with diabetes had about 2 to 4 times higher death rates from heart disease and stroke those without diabetes. Diabetes is the leading cause of new cases

of blindness in adults aged 20 to 74 years, and it is also the leading cause of end-stage renal disease, accounting for about 40% of new cases. Neuropathy is also a major problem, as 60% to 70% of people with diabetes have this condition, and more than half of lower limb amputations occur among people with diabetes (Deshpande, Harris-Hayes, and Schootman, 2008).

Globally, the International Diabetes Federation was prevalence estimated in 2010 that 6.4% of the world populations were diabetes (International Diabetes Federation., 2010). A national health examination Thai survey done in 2009 revealed that the diabetes prevalence was 6.0% among males and 7.7 % among females aged 15 years and above. The urban areas had higher prevalence than rural areas; the prevalence in Bangkok was 9.2%, 8.5% in male and 9.9% in female as the highest prevalence in Thai diabetes survey (Wichai Aekplakorn, 2009). Diabetes was ranked forth and third of the top 10 diseases among 3.2% in males (168,702 DALY) and 6.9% in females (267,549 DALY) respectively, based on disability-adjusted life-years in 1999. The rates of mortality diabetes have risen from 28.8 to 71.3 for the same period (Suwit Wibulpolprasert, 2007).

Hospitalization for type-2 diabetes complications accounts for more than half of the healthcare costs (Jonsson, 2002) and three-quarters of people with diabetes die from cardiovascular disease (Gray and Yudkin, 1997). The development of both micro- and macro-vascular complications is associated with elevated blood glucose, with research suggesting that the risk of serious complications increases with the length of time blood glucose is uncontrolled (UK Prospective Diabetes Study [UKPDS] Group, 1995).

In Thailand, the admission rate of diabetes had risen from 33.3 per 100,000 population in 1985 to 91.0 in 1994 and 586.8 in 2006. The diabetes in-patient rate in Bangkok was 945 per 100,000 populations in 2009 (Wichai Aekplakorn, 2009). The hospitalization rate in 2007 was ranked third in which 480,453 (763 per 100,000 population) and 44,508 (780 per 100,000 population) in Bangkok. (Bureau of Policy and Strategy, 2007).

Among Thai people, the prevalence of diabetes was estimated at 2.4% in 1995 and 3.5% in 2025 (Wild, et al.,2004). Diabetes and its complications are a costly burden on health care systems, which continue to increase at alarming rates. The rise in prevalence of diabetes leaded to an increase in prevalence of diabetic complications (e.g., retinopathy (23%), nephropathy (24%), amputation (1.6%), coronary disease (8.2%), and stroke (4.4%)) and diabetic comorbidities (e.g., hypertension (63.6%) and dyslipidemia (73.3%) (The Endocrine Society of Thailand Diabetes registey project 2003: the initial analysis diabetic registry team., 2005). Diabetic-related complications and co-morbidities largely affect patient outcomes and health-care costs. The diabetes treatment and may experience poor diabetes control, resulting in complications and avoidable hospitalizations related to diabetes.

There had few studies estimating the cost of diabetes. Based on the study determining the costs of patients with diabetes in seven Thai government hospitals located in four regions of Thailand and Bangkok, the annual average direct medical cost per diabetic patient was 6017 baht, which was significantly higher than those without diabetes (Pudsuk, 1999). In addition, the annual average total health-care cost per diabetic patient was 13,751 baht (i.e., direct medical and nonmedical cost [82.26%] and indirect cost [17.74%]) (Pornlertwadee, 2002).The average direct medical cost per outpatient visit was about 1,206 baht per diabetic patient (Jansaropos, 2003).

Diabetes in association with modernization and urbanization, the prevalence is slightly higher in urban than in rural areas (Prasit Keesukphan, 1999; Sathit Vannasaeng, et al. 1986). However, diabetes care in Thailand has not been complied with the guideline particularly in district hospitals due to limited resource. More than 50% of diabetic patients do not achieve target goal.

The effective of diabetes care for patients were delivery service of care in home health care setting by was required an individualized age- and condition-appropriate plan for glucose monitoring; medication administration, including medication schedule, meal composition, and patterning; integration and coordination

of diabetes management plan and coordination and collaboration with any other health care providers involved (nursing home health care team and physicians).

I.3 Literature review in Chronic Care Model for diabetes

A study by Roberto found that collaboration in chronic care model helped reducing cardiovascular. The patients were improved blood pressure, lipid levels, and HbA1c levels during the observation period. The study showed that a collaboration was designed to help organizations implement the chronic care model for diabetes was associated with improved risk for cardiovascular disease predicted by the United Kingdom Prospective Diabetes Study risk score (Vargas et al., 2007).

The study of nurse case manager used the conceptual model of chronic care model to foster productive interactions between informed and activated patient and a prepared, proactive practice team. The nurse case managers were introduced into the primary care setting and had continuous collaboration with their endocrinologists, diabetes educators, and dietitians. The primary outcomes were control to cHbA1c, blood pressure, LDL level to need improvement (Stuckey et al., 2009).

The University of Pittsburgh Medical Center had taken steps implements the chronic care model into its network to improve diabetes care processes and outcomes in practice setting. In 2000, UPMC leadership approved mechanisms for a strategic stepped approach and reorganization of care. The diabetes community decided to embark on a system-wide diabetes quality improvement initiative and bring elements of the CCM into practice. The integrating a multi-faceted approach to improving diabetes cares, including all elements of the CCM, has been shown the best outcome (Linda, Piatt, and Janice, 2004)

The study of Dennis was to determine whether multidisciplinary team-based care guided by the chronic care model could reduce medical payments and improve the quality of Medical enrollees with diabetes. The results had no statistically significant differences in the total payments between diabetes who received team-

based care comparing to those who did not. In clinical results were patients with HbA1c>9 at baseline experienced an average reduction of 0.75mg/dl per year, and patients with systolic blood pressure > 140 mmHg at baseline had an average reduction of 2.2 mmHg per year (Dennis, 2008).

The diabetes disease management programs (DMPs) in Germany, as had currently been established establish in primary care that had impacted provided care significantly. Patients with type 2 diabetes enrolled in this program were more likely to receive patient-centered, structured, and collaborative care according to the chronic care model. The DMPs had changed patients' manners in the way that they could take better care of themselves and it was a larger extent reflects the core elements of the chronic care model (Szecsenyi et al., 2008).

According to the randomized controlled trial, Rich et al demonstrated that nurse-direct program of patient education with post-hospital telephone and home visit follow-up (self-management support and delivery system redesign) was associated with a 56% reduction in hospital readmission for congestive heart failure (CHF) and significant improvement in quality of life scores compared with controls (Rich et al., 1995).

II. Drug Related Problems (DRPs)

Although pharmacotherapy was beneficial in the elderly, it resulted in drug-related problems (DRPs) and a drug- related morbidity had manifest as a treatment failure or as a new medical problem (Hepler and Strand, 1990). An estimated 58.9% (range, to 32 86%) of drug-related hospital admissions were preventable. Causes of preventable drug-related hospital admissions had included adverse drug reaction (sometimes determine to contraindicated or unnecessary drug therapy), over-dosage, under-dosage, lack of necessary drug therapy, patient non-adherence, inadequate follow up, and problem with a nonprescription drug. The number of DRPs per patient increased approximately linearly with the increase in number of drugs used; one unit increase in number of drugs yielded a 8.6% increase in the number of DRPs (Viktil,

2006). The studies of the prevalence of adverse drug reactions (ADRs) in both hospitalized and community-based patients demonstrated that the incidence of ADRs rose with increasing age and the number of medications taken (Runciman et al., 2003)

The Dale study showed that pharmacists recommended a drug therapy change in about 50% of patients and contacted the prescribe more than 85% of the time. About 50% of patients with drug therapy problem had a change in drug therapy. Prescription use during the post-intervention period decreased in both the study and control groups but was statistically significant only among the control groups. Pharmacists provided the following educational services: medication use (90%), disease management (88%), adherence, and self-care (60%). Survey results indicated that patients highly valued the service (Christensen et al., 2007).

Sidel (1990) conducted a randomized controlled trial of an 11-month clinical pharmacist intervention in 284 older adults living at home and at high risk for DRPs. Clinical pharmacists paid home visits and provided telephone follow-up as needed to patients receiving the intervention. Pharmacists developed patient-specific medication information packets, cleaned patients' medicine cabinets, counseled patients on good medication taking practices, and stressed good communication with health care providers (Sidel et al.,1990).

In a randomized controlled trial from England, (Begley, 1997) evaluated an intervention in which a clinical pharmacist paid 5 home visits to 190 elderly persons over 12 months to counsel them about compliance and medication management. Nonetheless, this home-based pharmacy intervention was effective in reducing certain DRPs and improving certain related health outcomes.

A randomized controlled trial from Scotland that evaluated the effect of a clinical pharmacist medication review of DRPs, health related quality of life (HRQOL), and health services utilization in 332 older adults who had more than 2 chronic diseases and regularly took more than 4 prescribed medications. Clinical pharmacists conducted in-home interviews and developed a pharmaceutical care plan.

The pharmacists implemented all actions agreed on by the patients' physicians. At the 3-month reassessment, significantly more DRPs were resolved in the intervention group (Krska et al., 2001).

Goodyer conducted a randomized controlled study of a disease-specific intervention in which a clinical pharmacist provided intensive in-home medication counseling to improve compliance in 100 elderly patients with chronic stable heart failure. Compliance scores (as determined based on pill counts) and medication knowledge had improved significantly in intervention patients compared with control patients at 6- to 12-week follow-up, patients benefited from medication counseling by a clinical pharmacist (Goodyer, Miskelly, and Milligan, 1995).

The pharmacists' intervention and a randomized controlled trial involved 362 hospitalized patients aged more than 75 years who were taking more than 4 medications. At hospital discharge, a hospital pharmacist assessed patients' medication-management skilled and provided written and verbal information to enhance adherence. This was followed within 2 weeks of discharge by a home visit by a community pharmacist, who again stressed adherence and medication knowledge. A research assistant collected information about outcome measures at 3 and 6 months (Nazareth et al., 2001).

Al-Rashed studied the effect of the use of medication summaries, counseling, and a simple medicine reminder card on compliance, medication knowledge, and health services utilization in 83 hospitalized elderly patients who were prescribed more than 4 drugs at hospital discharge. A pharmacist counseled the intervention group about their medications and compliance before discharge, and another pharmacist paid 2 home visits to patients (at -2-3 weeks and 3 months after discharge). Compliance was significantly better at the 2 home visits in the intervention group compared with the control group ($P < 0.001$). Thus, the use of inpatient pharmacist counseling linked to a medication list and outpatient reminders appeared to result in better compliance, as well as a reduction in unplanned physician visits and hospital re-admissions (Al-Rashed et al., 2002).

Pharmacists had documented the ability to safeguard patients by using a variety of methods, such as by detecting and averting medication prescribing errors, dosing appropriately in patients with impaired renal function, and identifying and solving drug related problems (Lesar, Briceland, and Stein, 1997).

The medication assessment of elderly patients age 65 and over using six or more drugs by community pharmacists played an important role in the identification, assessment and prevention of potentials drug related problems in the elderly. The potential drug related problems were avoided by the intervention of community pharmacists in collaboration with prescriber and the patient. The two or more potential drug related problems 90% occurred in patients and 3.9 potential drug related problems per elderly person. This study was defined groups of drug related problems into the three categories of potential DRPs as patient related 4.7%, prescriber related 55.7% and drug related 39.6% (Vinks, 2006)

A randomized controlled study by Zermansky examined the impact of a clinical pharmacist intervention on prescribing for elderly outpatients in the United Kingdom. The sample contained 1188 patients from 4 general medicine practices who were receiving more than 1 repeat prescription. Patients seen by the pharmacist for medication review had significantly more drug changes resulting in significant cost savings (equivalent to -$100/patient per year) (Zermansky et al., 2001).

The outcomes of a structured pharmaceutical care program that provided by community pharmacists to elderly patients taking more than 4 medications. This study was performed in 7 European countries and involved 1290 intervention patients and 1164 control patients. The intervention pharmacist received 1 day of training, as well as a training manual. Follow-up was at 6, 12, and 18 months. The primary outcome was HRQOL (measured using the SF-36), on which power calculations were based. It appeared that hospitalizations and the associated costs were also a priori primary outcomes. The contact with general practitioners was another health outcome measured. Process measures included knowledge, compliance, medications numbers,

nonprescription drug use, and changes in therapy. The mode of assessment of the outcome measures was patient self-report (Bernsten et al., 2001).

There was a study of identify factors that affected drug related problems in diabetes inpatients at Rajavithi hospital in 2002. The drug related problems found that was 47% adverse drug reaction, 38% too much of the correct drug, 7% need for additional drug therapy, 4% taken the wrong drug, 1% taken unnecessary drug therapy, and 80% non-compliances. The diabetes was tendency to have many drug related problems (Chutithana Werawathanachai, 2002).

The study of drug administration of patients and family by nursing home care that medical error were related to drug related problems. The patients had more than 2 diseases and 5-6 drugs used per patient. The drug medical error had occurred in patient that received more than 3 drugs (Prasanathikom, 2008).

The study showed that pharmaceutical care implementation helped the cost savings of medication related problems from drugs at medical in wards hospital. Pharmacists followed and evaluated patients' medications in order to identify, resolve, and prevent medication related problems (Siriprapat et al., 2007).

Polypharmacy generally referred to the use of multiple medications by a patient. The term is used when too many forms of medication are used by a patient, more drugs are prescribed than clinically warranted (Fulton and Allen, 2005). The polypharmacy increased with higher age (Chrischilles et al., 1992) and comorbidities were major risk factors for experiencing drug related problems (Ruths, Straand, and Nygaard, 2003).

The common result of polypharmacy was increased adverse drug reactions and higher costly by older patients (Haider et al., 2007). It also increased the possibility of adverse medication reactions, side effects and drug-drug interactions due to polypharmacy. High pill burden had also been associated with increased risk of

hospitalization, medication errors, and increased costs both for the pharmaceuticals involved and for the treatment of adverse events.

The chronic diseases have several medical conditions requiring multiple pharmacological treatments. More than 75% of older patients reported using more than 1 prescription medication, and 21% reported using more than 5 prescription medications. Because polypharmacy was so common in this group, older adults had an increased risk of having an adverse drug event due to used of a potentially inappropriate medication (Kaufman et al., 2002).

III. Medication Therapy Management (MTM) Model

III.1 Pharmaceutical Care

In 1990, Hepler and Strand defined the new way to look at the responsibilities of the pharmacist and pharmacy services, applying the term “pharmaceutical care” to new concept of pharmacists’ service (Hepler and Strand,1990). As updated definition describes pharmaceutical care as a patient-centered practice in which the practitioner assumes responsibility for a patient’s drug-related needs and was hold accountable for the commitment (Cipolle, Strand, and Morley, 2004). The philosophy of pharmaceutical care focuses on the responsibility of the pharmacist to meet all of the patients’ drug-related needs, be hold accountable for meeting those needs, and assist the patient in achieving goals through collaboration with other health professionals.

III.2Disease Management

Disease management programs were developed and widely adopted in the 1990s, largely due to the establishment of health maintenance organizations. The Disease Management Association of America defined disease management as “a system of coordinated health care interventions and communications for populations with conditions in which patient self-care efforts are significant” (Disease

Management Associationof America., 2006). These program were inter-professional in nature and provided by a wide variety of health care professionals, including physicians, nurse, nutritionists, and pharmacists. Disease management focuses on a specific disease, providing patients with the tools and knowledge that need to assume some responsibility for their own care. Multi health professional could participate in the management of one patient to achieve health care goals. Disease management programs developed by pharmacists included anticoagulation, hypertension, dyslipidemia, asthma, diabetes, and others (Knapp, Okamoto, and Black, 2004); nevertheless, by definition did not address the patient's entire drug regimen.

III.3 Medication Therapy Management Model (MTM)

In July, 2004 the eleven pharmacy organizations achieved consensus on a definition of medication therapy management, The American Pharmacists Association (APhA) and the National Association of Chain Drug Stores (NACDS) Foundation had developed a model framework for implementing effective MTM services in a community pharmacy setting. This model describes core elements of MTM services that provided by pharmacists across the spectrum of community pharmacy (American Pharmacists Association and the National Association of Chain Drug Stores Foundation., 2008). The medication therapy management under the Medicare Modernization Act of 2003 (effective January 2006) represented a valuable opportunity for community pharmacy pharmacists to enhance patient care and address the nationally recognized needed to identify and resolved medication therapy problems (Johnson and Bootman, 1995)

The MTM model was driven by the philosophy of pharmaceutical care which was viewed as a comprehensive framework for all drug-focused patient care service components of the practice of the pharmacist. The pharmacist was the ideal health care professional to provide service that was designed to improve care with enhance communication and among patients and providers, improved collaboration among pharmacists, physicians and other healthcare professional; enhance communication

between patients and their healthcare team; and optimized medication use for improved patient outcomes (Wagner, 1998).

The focus of MTM was on individual patient, with the intention of optimizing the patient's drug regimen to best achieve appropriate therapeutic goals for that patient. The medication therapy management services described in this model empowers patients to take an active role in managing their medications. The services were dependent upon pharmacists working collaboratively with physicians and other healthcare professionals to optimize medication use in accordance with evidence-based guidelines (Institute of Medicine., 2001). APhA and the NACDS Foundation believed that a unified vision of core components of MTM in community pharmacy could enhance the efficiency and efficacy of services for all patients, were supportive of improved patient outcomes and were recognized by patients, payers and providers for the value. Ideally, patients or caregivers will receive MTM services at the pharmacy where they have filled their prescriptions and from a pharmacist with whom they have an ongoing relationship. The pharmacist can initiate MTM services when complex medication therapy problems are identified through the dispensing process (American Pharmacists Association and the National Association of Chain Drug Stores Foundation., 2008).

The medication therapy management model had five core elements form a framework for the delivery of MTM services in pharmacy practice. Every core element is integral to the provision of MTM; however, the sequence and delivery of the core elements may be modified to meet an individual patient's needs.

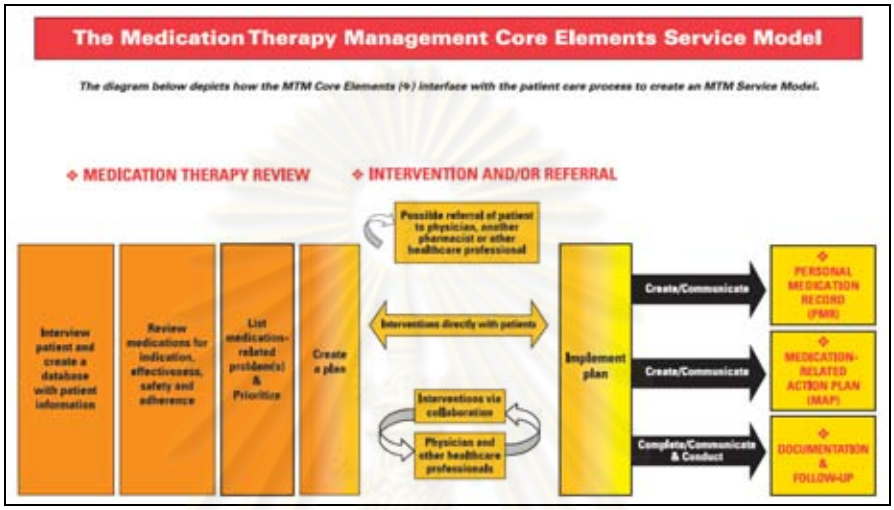
III.3.1 Medication Therapy Management Component

The five core components of MTM model in pharmacist processes, described on the following (See figure 3):

1. Medication therapy review (MTR)
2. A personal medication record (MPR)
3. A medication action plan (MAP)
4. Intervention and referral

5. Documentation and follow-up.

Figure 3: Diagram of a medication therapy management service model (American Pharmacists Association and the National Association of Chain Drug Stores Foundation., 2008)



1. Medication therapy review (MTR)

The pharmacist completed a medication therapy review (MTR) consultation with the patient or caregiver, preferable in person and face-to-face interaction established or enhanced the pharmacist-patient relationship. This interaction allowed the pharmacist the optimal ability to observe signs of and visual cues to the patients' health problems, such as adverse drug reaction, drug interactions. The pharmacist's observations can result in early detection of medication-related problem and thus can reduce emergency room visits, hospitalizations, and readmission. In comprehensive MTR, the patient presented all current medications to the pharmacist, including all prescription and nonprescription medications, herbal products, and other dietary supplements. The targeted MTRs were used to address new medication problems identified by pharmacist or for ongoing medication monitoring during follow-up visits. The MTR was tailored to the individual needs of the patient at each visit. The MTR included any of the following:

- Assessing, on the basis of all relevant clinical information available to the pharmacist, the patient's physical and overall health status, including current and previous disease or conditions.

- Assessing culture issues, patient preference, education level, language barriers, and other characteristics of the patient's communication abilities that could adversely affect outcome
- Interviewing the patient or caregiver to detect symptoms that could be attributed to adverse events caused by any of the current medications
- Assessing, identifying, and resolving medication therapy problems related to the appropriateness of dose and dosing regimen of each medication, including consideration of indications, contraindications, potential adverse effect, and potential problems with concomitant medications, adherence to medication therapy.
- Monitoring and evaluating the patient's response to therapy, including safety and effectiveness
- Interpreting, monitoring, and assessing patient laboratory results, when available
- Providing education and training on the appropriate use of medications and monitoring devices, the importance of medication adherence, and understanding treatment goals
- Communication appropriate information to the physician or other health care provider, including consultation on the selection of medications.

2. Personal Medication Record (PMR)

PMR was intended for patients to use in medication self-management and to voluntarily share with health care providers to enhance continuity of care. The patient was instructed to show the PMR to health care providers at all appointments to help ensure that each practitioner was aware of the patient's current medication regimen. Patients were instructed to take the PMR with them if they were being admitted to a hospital or other institution or if they must visit an emergency room.

Patients were also instructed to bring the PMR to all visits to the pharmacy. Each time the patient received a new medication, had an instruction change, beings using a new nonprescription medication or dietary supplement, or had any other changes to the medication regimen, the PMR should be updated to ensure a complete

and accurate record. Ideally, the pharmacist should be an active participant in this process.

3. Medication Action Plan (MAP)

A care plan is the health professional's courses of action for helping a patient achieve specific health goals. The care plan is an important component of the documentation core element outlined in this service model. In addition to the care plan, which is developed by the pharmacist and used in the collaborative care of the patient, the patient receives an individualized MAP for use in medication self management. Completion of the MAP is a collaborative effort between the patient and the pharmacist. The patient MAP includes only items that the patient can act on that are within the pharmacist's scope of practice or that have been agreed to by relevant members of the healthcare team. The MAP should not include outstanding action items that still require physician or other healthcare professional review or approval. The patient can use the MAP as a simple guide to track his or her progress. The patient MAP, coupled with education, is an essential element for incorporating the patient-centered approach into the MTM service model. The MAP reinforces a sense of patient empowerment and encourages the patient's active participation in his or her medication-adherence behavior and overall MTM. In addition, the pharmacist can serve as a resource to the patient's physician and other health care providers, communicating MAP information in health care provider specific format. Patients were instructed to bring the MAP with them to all visits to the pharmacy. Each time a medication-related issue was resolved, the result and date should be recorded on the MAP

4. Intervention and referral

During the course of an MTM visit, medication therapy problems were identified that require the pharmacists to intervene on the patient's behalf. Pharmacists intervene to resolve medication therapy problems as part of any pharmacy service, including dispensing and collaborating with physicians or other healthcare professionals to resolve existing or potential medication-related problems or working with the patient directly. The communication of appropriate information to the physician or other

healthcare professional, including consultation on the selection of medications, suggestions to address medication problems, and recommended follow-up care, is integral to the intervention component of the MTM service model.

The referrals required to additional health care providers include the following:

- New problems discovered during MTR might necessitate referral to physician for evaluation and diagnosis
- Patients required disease management education from pharmacist or other health care providers to help them manage chronic diseases such as diabetes.
- Patients who required monitoring for high-risk medications, such as warfarin, might be referrals to physicians in hospital.

The intent of intervention or referral was to optimize medication use, enhance continuity of care, and encourage patients filly utilize available health care services to prevent future adverse outcomes, whether clinical, humanistic, or economic.

5. Documentation and follow-up.

Documentation was an essential component of patient care. The pharmacist was responsible for documenting services in a manner appropriate for evaluating patient progression. The use of core documentation elements will help to create consistency in professional documentation and information sharing among members of the health care team.

Documentation of MTM services should include the following categories of information:

- patient demographics, known allergies, disease or conditions,
- A record of all medications, including prescription, nonprescription, herbal, and other dietary supplement products
- Assessment of medication therapy problems and plans for resolution
- Therapeutic monitoring performed / intervention or referral made
- Schedule and plan for follow up appointment

The feedback of prescribers and other professionals involved in a patient's care of through MTM documentation. At the end of a MTM visit, the pharmacist schedules a follow up appointment with the patient or caregiver according to individual patient requirements. Documentation and consistent follow up enhance continuity of care.

The all patients using medications would benefit from the core MTM services outlined was the documentation. Pharmacists could utilize one or more of the following factors in targeting patients who were likely to benefit most from MTM services in their practice.

Patients who were received medications form more than one prescriber, more than chronic medications, at least one chronic disease, laboratory values outside the normal range, non-adherence to the medication regimen for more than 3 months, or patients discharged from a hospital(American Pharmacists Associatin and National Association of Chain Drug Stroes Foundation., 2005).

The important elements of a quality medication therapy management program: (Academy of Managed Care Pharmacy, 2006)

1. Patient-centered approach

   Effective management of a patient should consider such aspects of that patient's environmental, social and medical status that may be factors. A patient-centered approach to managing and implementing MTM programs will help ensure that the correct medication, including dose and dosing regimen, is prescribed. It is inherent in such an approach that decisions will be made based on current and accurate medical information.

2. Interdisciplinary, team based approach

   Services offered by MTM programs should be delivered by an interdisciplinary MTM team led by a qualified pharmacist or other health care professional; team members should have expertise in the specifics of the medications in question. The inclusion of different perspectives will often highlight problems that may be unforeseen when only the prescriber and patient are involved. Ineffective use of medications is a multi-factorial problem. Effective MTM programs address these factors as well as the root causes of suboptimal use of medications and the fundamental changes that will be necessary. No single health care professional has all of the answers to all of these problems for all patients. Therefore, MTM programs may involve representatives of a variety of professions so that more effective programs can be delivered.

3. Communication

   Effective communication and sharing of pertinent care information between those parties involved in the prescribing, dispensing, monitoring and educational components are vital to the successful use of medications.

4. Population and individual patient perspective

   MTM programs are developed for target patient populations so that services can be individually delivered to patients.

5. Flexibility for broad application

   Programs can be designed and implemented to address the needs of additional at risk patient populations.

6. Evidence-based medicine

   The adoption and application of evidence based medicine is a growing force in health care. There should be recognition that best practices predicated on rigorously applied evidence-based medicine should be incorporated into MTM programs.

7. Promotion of MTM services

   Mutual promotion of MTM by health plans and health care professionals can help enhance adoption.

III.4 Literature Review in Medication Therapy Management Model

The new opportunities arise, all pharmacists in community practice shared a common vision for patient-centered medication therapy management that that enhances pharmacists' role in our nation's health care system. Pharmacist were in a prime position to assure the success of collaborative practice efforts because of their accessibility to patients and physicians, access to resources needed to provide an advanced level of care, information management capabilities, motivation to expand care, and education and training ideal for providing patient-focus MTM services (Benjamin, 2005). The research effort to date value of pharmacists that empowering patients, increasing collaboration, enhancing safety, improving outcomes, and reducing total costs for care over time (Cranor, Bunting, and Christensen, 2003; Garrett and Bluml, 2005; Wilson et al., 2005).

A specific setting was not required to conduct MTM service, but this service was performed anywhere the pharmacist and patient could conduct medication evaluation in a comfortable, private area. MTM setting included community pharmacy practice, ambulatory clinics, institutional pharmacy practice, consulting practice, and other community where a private area was available for a pharmacist to meet with a patient (Melissa,2007).

The study by 12 pharmacy locations in Asheville that were assess clinical, humanistic, and economic outcomes of a community-based medication therapy management (MTM) program for 207 adult patients with asthma over 5 years. The results were that the number of patients visit in emergency department decreased from 9.9% to 1.3%, and in hospitalizations from 4.0% to 1.9%. The average direct cost salving was $725 /patient/year, and indirect costs saving were estimated to be $1,230/ patient/year. The missing nonproductive workdays decreased from 10.8 days/year to 2.6 days/year. The patient with asthma who received education and long term medication therapy management services by community pharmacists that achieved and maintained significant improvements and had significantly decreased overall asthma-related costs dispensing medication (Berry and Carole, 2006).

The longitudinal, quasi experimental, community-based study by Berry was done in Asheville. The 620 patients with hypertension, and/or dyslipidemia were participated in CV (cardiovascular or cerebrovascular) risk reduction program over a 6 year period for educations, long term follow-up by 18 certificate-trained pharmacists (reimbursed by health plans) using schedule consultations, monitoring, and recommendations to physicians. The results were that the cardiovascular health improved over the course of the study as percentage of patients at blood pressure goal, from 40.2% to 67.4%, LDL cholesterol goal from 49.9% to 74.6%. The mean cost per CV event in the study period was $ 9,931, compare with $14,343 during historic period. CV medication use increased nearly threefold, but CV- related medical costs decreased by 46.5%. The long-term care by medication therapy management services achieved significant clinical improvements and significant increase in the use

medications, and a decrease in CV events and related medical costs (Barry, Benjamin, and Sutherland, 2008).

In the US, the Medicare Modernization Act of 2003 required that Medicare Part D insurers provide medication therapy management (MTM) services to selected beneficiaries, with the goals of providing education, improving adherence, or detecting adverse drug events and medication misuse. Medication Therapy Management programs were approved by the Centers for Medicare and Medicaid Services (CMS). Pharmacy, medical and insurance organizations had provided guidelines and definitions for MTM programmed, distinguished them from other type of community pharmacy activities. This program focused on medications and multiple conditions, delivered independent of dispensing and involve collaboration with patients and providers however, the mode of deliveries (i.e. face-to-face or by telephone) for MTM were not consensus on recommended (Pellegrino et al., 2009).

The Pharmacy Society of Wisconsin created the WPQC network, which consisted of 53 pharmacists, 106 trained pharmacists and initial payer. The WPQC described a quality-based network of pharmacies any payers with the common goal of improvement medication use and safety, reducing health care costs for payers and patients, and increasing professional recognition and compensation for pharmacist-provided quality services in medication therapy management services. This program demonstrated that collaboration among payers and pharmacists and development of an incentive-aligned program that quality patient (Trapskin et al., 2009).

The analysis of pharmacist-provided medication therapy management services in community pharmacies over 7 years were reviewed from database of nearly 100,000 MTM claim. The mean ([SD]) median) of pharmacy reimbursement was $8.44 ([$5.19]) $7.00) per MTM service, and the mean of estimated cost avoidance (ECA) was $93.78 [($1,022.23] $5.00). MTM interventions over a 7-year period evolved from primarily the provision of patient education involving acute medications toward consultation-type services for chronic medications. The services provided by community pharmacists had the effect on medical costs associated with avoidance of

physician visits, emergency room visits, and hospital admissions. The proportion of MTM claims in which pharmacists self-related their services as avoiding higher dollar medical cost event increased. The expectation of continue as pharmacist were given more opportunities to provide MTM services and receive reimbursement for the identification and resolution of increasingly complex drug related problems (Barnett et al., 2009).

IV. Home Health Care

Home care was a form of health care service provided where a patient lives. Patients can receive home care services whether they live in their own homes, with or without family members, or in an assisted living facility.

IV.1 Definition of Home Health Care

The definition of home health care is various types of home care and vary depending on their source and use. Definitions created from a provider perspective tent to emphasize services and beneficial patient/ family outcomes, compared to payor definitions the emphasize service/ provider qualifications and limitation on services.

Home health services was that component of comprehensive health care whereby services were provided to individuals and families in their places of residence for the purpose of promoting, maintaining, or restoring health or minimizing effects of illness and disability. Services appropriate to the needs of the individual patient and family were planned, coordinated with organization for delivery of health care through the use of contractual arrangements, or a combination of administrative patterns (McNenara, 1982).

The American Nurses Association in 2008, the definition of home health were emphasized the multidimensional objectives of the field: Home health nursing was the provision of nursing care to acutely ill, chronically ill, terminally ill, and well patients of all ages in their residences. Home health nursing focuses on health promotion and

care of sick while integrating environmental, psychosocial, economic, cultural, and personal health factors affecting an individual's and family's health status (Humphrey and Milone, 1996)

The definition of home health provided by the Joint Commission on the Accreditation of healthcare Organizations (The joint Commission, 2005) briefly outlines expect services and recipients of care; Home health services were those services provided by healthcare professionals on a per-visit /or per-hour basis to patients who had or were at risk of an injury, an illness, or a disabling condition or who were terminally ill and require short-term and/ or long term interventions by health professional (Joint Commission on Accreditation of Healthcare Organization , 2005).

Health Care Financing Administration represented the payor perspective in its 1996 regulatory definition of a home health agency: definition of home health that emphasize service limitations had tented to shape home health policy in the last decade, reflecting interpretations that service utilization exceeded actual need or that home health cost containment was essential to achieve containment of all healthcare spending (Center for Medicare and Medicaid Services, 1996).Home health care was the provision of health care services to people of any age at home or in other non-institutional setting (Harris, 2010).

IV.2 Overview of Home Health Care

Home care was proposed as a cost-effective alternative to institutional care for both acute and long-term care needs. Concurrently, the aging of the population in worldwide substantially increased the need and demand for home care services by the elderly.

As home care became a more prominent service and represented increasing expenditures of resources, it too became the focus of cost-effectiveness scrutiny and cost-containment regulation. The questions were raised about the quality of care being provided by home care providers (Violet, 2004).

United Stated of America, home health care encompasses a wide range of health and social services were delivered at home to recovering, disabled, or chronically or terminally ill people in need of medical, nursing, social, or therapeutic treatment and/or assistance with essential of daily living. The first home health agency was established in the 1880s and the number grew to about 1,100 by 1953 and at the end of 2003 the number rose to over 7,000 agencies delivering home care services to 7.6 million people. The 2000 National Home and Hospica care survey found that 70% of home health care patients were 65 years and older. Medicare was the primary source of funding for most home care services (52%), followed by Medicaid (20%) and private sources (17%) (Somnath, 2005). Data from the Health Care Financing Administration showed the expenditures for home health care increased from $2.4 billion in 1980 to $32.3 billion in 1997 and was projected to exceed $60 billion by the year 2007 (Health Care Financing Administration, 2008).

Home health care is medical care that is provided in the home of the patient. To qualify for Medicare coverage of home health care, a beneficiary must be home-bound, under the care of a physician and require part-time or intermittent skilled care. The early 1990s witnessed unprecedented growth in Medicare expenditures for home health care, with expenditures increasing from $3.4 billion in 1989 to $19.2 billion in 1996.1 During this time, the percentage of beneficiaries who used home care almost doubled from 5.1% to 9.5% and the number of visits per user almost tripled from 27 to 79 (U.S. Congress, 2000). This growth was precipitated by a liberalization of the Medicare home care benefit.

The pharmacists in Australia received remuneration from the Australian Government for conducting comprehensive Home Medicines Reviews. In Canada, pharmacists in certain provinces have limited prescribing rights (as in Alberta and British Columbia) or are remunerated by their provincial government for expanded services such as medications reviews in Ontario. In the United Kingdom, pharmacists who undertake additional training are obtaining prescribing rights. They are also being paid for by the government for medicine use reviews. In the United States, pharmaceutical care or clinical pharmacy had an evolving influence on the practice of pharmacy.

IV.3 Type of home care organizations

3.1 Home health care; professional services provided in a patient's place of residence on a part-time, intermittent, hourly, or shift basis.

3.2 Hospice; An organized program of interdisciplinary services for terminally ill patients and their families to provide palliative medical care and supportive social, emotional, and spiritual services.

3.3 Support care; Supportive services related to assistance with the instrumental activities of daily living provide on the part-time, intermittent, shift, or hourly, or shift basis.

3.4 Personal care; personal care related to assistance with activities of daily living provided on part-time, intermittent, hourly, or shift basis.

3.5 Home infusion therapy; Provision of both pharmaceuticals and skilled nursing services.

3.6 Home medical equipment/durable medical equipment; companies that provide equipment in the home care setting.

IV.4 Home Health Care Team

Home care is a form of health care service provided where a patient lives. Patients can receive home care services whether they live in their own homes, with or without family members, or in an assisted living facility.

The purpose of home care is to promote, maintain, or restore a patient's health and reduce the effects of disease or disability.

4.1 Physicians were responsible for the treatment at the hospital and at home, and had to decide when the patient should be discharged from the hospital and cared for continuously at home.

4.2 Nurses were the leader of team which provide and planning the home health care, coordinate the activities of the member of the health team, monitor the home health care, collect data and information, follow up the outcome of the home health care and report it to the responsible

working unit, and provide health care according to plan and teach the patient how to take care of patients.

4.3 Pharmacists provided advice and support to patients, caregiver and staff within home care team, to ensure the proper and effective ordering of drugs and appliances and their clinical and cost effective use, their safe storage, supply and administration and proper record keeping.

4.4 Therapists were responsible for rehabilitation in case of disability and should try to prevent that the situation of the patient gets worse. Injured patients who lost a hand or leg for instance should regular exercise; get massage, electronic stimulation and heat according to medication requirements.

4.5 Social workers gave advice and consulted to patients, caregivers or the member of the family in connection with the social-and emotional issues affecting the patient. They were as coordinator by the links to community.

4.6 Nutritionists composed the food controlled for a patient who is on rehabilitation or a patient who suffered from the chronic diseases such as heart disease, diabetes mellitus, or obesity. They advised for patients, caregivers, or health care team.

IV.5 Structure of Home Care Organizations

Home care organizations currently operate under a variety of structures:

5.1 Not-for-profit: a voluntary agency with a charitable mission

5.2 Proprietary: a private, profit-making agency

5.3 Public: an agency operated by government

5.4 Subdivision: a component of a multi-function entity, such as a hospital or managed care organization.

IV.6 Pharmacist Home Health Care

American Society of Health System Pharmacists (ASHP) determined the pharmacist home care was the provision of specialized, complex pharmaceutical products and clinical assessment and monitoring to patients in their home.

The purpose of pharmacists practicing in home care provided a specialized form pharmaceutical care to the patients they serve. Home care pharmacies, whether they were hospital-based, long term care pharmacies, community pharmacies, independent organizations, or multisite organizations, should be viewed as an integral component of the overall health system.

The pharmacist home care purposed to ensure the safe, appropriate and effective use of medications in the home, home care pharmacies should develop comprehensive services to address factors unique to home care. The providers of pharmaceutical care in home setting, pharmacists should be concerned with the outcomes of their services and not just the provision of their services. Effective management was necessary to ensure that quality outcomes of therapy were achieved (Hawkins, 2009).

Pharmacy as a profession had fought to become an integral part the care of institutionalized patients, mainly by controlling all medication dispensing and processing orders, thereby enabling pharmacist to identify and resolve drug-related problems (DRPs).

IV.7 Literature Review in Home Health Care

As the Solomon's study, patients used an average of 5 prescription medications each. Fifty-five percent of patients were found to have poor medication compliance (Solomon, 1978). Ninety-five percent of patients were to be nutritional risk. Cardiovascular disease was the most common health problem reported. These results support the supposition that patients receiving home care frequently use multiple prescription medications and have difficulty adhering to their regimens. The advanced age, nutritional risk, and high incidence of cardiovascular disease and depression in

this population, a need for pharmaceutical care. The study performed a 12-month observation study on the impact of home-based pharmaceutical care. The authors sought to identify specific problems associated with drug therapy and evaluate the contributions made by pharmacist. A medication profile was developed for each patient; pharmacist performed an initial home visit, attended multidisciplinary case conferences regularly, and communicated pertinent patient information to other healthcare professionals. Each patient was assessed for misused of medications, understanding of the medication regimens, and presence of drug related problems. The impact of the pharmacist's intervention on each patient's care was assessed subjective by a nurse.

To further define the role of the pharmacist in the care setting, Hunter and colleagues studied the effect of pharmaceutical care on 49 elderly patients managed by a home based mental health and aging service. Patients who were taking fewer than 3 prescription drugs were excluded from study. Enrolled patients received a single home visit by an ambulatory care/geriatric pharmacist and a nurse case manager. The pharmacist also assessed the patients for proper medication use and for the presence of drug related risks by means of a previously tested assessment tools (Hunte, 1996).

The study performed by His Der and colleagues provides valuable insight into the potential for adverse drug events in a population of 20 elderly veterans receiving home care. By performing multiple home visits, pharmacists were able to initially identify potential drug related problems as well as track their resolution during subsequent visits. The assessment, the pharmacist verified that each medication had a corresponding indication, performed an in-home medication inspection when allowed, and answered all medication-related questions. Physicians were contacted in cases where opportunities for alterations in medication regimens were identified. It was found that the patients had a large number of active medical conditions and nearly half of the patients (45%) lived alone. Patients received prescription multiple physicians (mean, 2 per patient; range, 1-5) and average 6 prescription medications each. Overall, they were prone to noncompliance, with a mean of only 4.7

prescription medications being taken on routine basis. Overall, 90% of patients had at least 1 medication discrepancy problem, and a typical patient received 3.7 pharmacist interventions. Pharmacist interventions included counseling (100% of patients), recommendation for drug regimen changes (60%), drug removal (30%), recommendations for laboratory testing (20%), and recommendations for use of metered dose inhaler assistive devices (15%). In 6% of cases, patients were taking medications that were not presently prescribed. Thirty percent of patients had potentially unnecessary medication removed from the home, and 60% received recommendations for regimen changes. By the second visit, the number of discrepancies and problems decreased significantly, with medication discrepancies reduced by nearly 50% (Hsia Der and Rubenstein, 1997).

A review published by Triller and colleagues describes pharmacist involvement in the care cal care pharmaceutical care in this setting. A pharmacist practicing at a home health care agency was shown to improve patient care through the dissemination of drug information and the provision of appropriate care. Twenty-nine patients who were enrolled in a long term care program received home visits and comprehensive drug regimen evaluations. Patients were elderly (mean, 66 years) and took an average of 8.8 different medication per day (range, 4-25). Multiple drug therapy recommendations were made on half of the patients (4.4 per patient), the majority (74.4%) of which were considered by the pharmacist to be of moderate or high clinical significance. Thirty-three percent of pharmacist recommendations were more likely to be accepted (Triller et al., 2000).

In the ability a study by Rainville, who demonstrated the ability of a pharmacist to reduce re-hospitalization rates in patients with heart failure, which is the most common hospital discharge diagnosis of patients over 65 years old. A substantial proportion of the enrolled patients did receive home health care services, demonstrating that the addition of the pharmacist to the care of home health care patients were beneficial. Indeed, a multidisciplinary home-based intervention that included a pharmacist had been shown to improve health-related outcomes in patients with heart failure (Rainville, 1999).

The study of home-based medication review by a pharmacist for at risk older patients in a primary care setting can reduce hospital admissions. The participants were over 80 years of age, taking four or more medicines, and had at least one additional medicine-related risk factor. The intervention comprised two home visits by a community pharmacy that intervention did appear to reduce prescribing, and no positive impact on clinical outcomes or quality of life (Lenaghan, Holland, and Brooks, 2006).

The pharmacist home medication reviews in Australia were studied by Simon and colleagues in mental illness patients. The general practitioners and community pharmacists were collaboration model in reduced adverse drug events from drugs treatment. The community pharmacists were reviewed and interviewed 49 patients in their home. The drug related problems in the outline drug related, prescribers related, and prescriber related and response recommendations and accepted from physicians were reported. The high rate of acceptance of pharmacist's recommendations (90%) in referring by reported of home medication review to general practitioners. Community pharmacists home visit, as occurred in this study, were an effective way to provide information about drugs to patients with mental illness (Bell et al., 2006).

The community pharmacists were included as integral members of the multi-professional team, can effectiveness to improve pharmaceutical care for palliative patients in the community, proving addition support for patient at home (Campion P.D., 2002). American Society of health-system pharmacists, during the home visit pharmacist reviewed the use of all medications including those prescribed by physicians, over-the-counter products, natural remedies and any other medicinal substances kept at home (American Society of Health-system pharmacists, 2000).

The community pharmacy was also a setting where patients in special need of a medication review may be identified. The pharmacy-based medication reviews provided in Canada, named MedsCheck (Dolovich et al., 2008) was similar reviews conducted in Sweden (Montagomery et al., 2008).

The provision of home health care services by pharmacists practice in all health setting such as hospital pharmacists, and community pharmacists had a professional responsibility to ensure that all patient care responsibilities were defined, understood, agreed upon, and documented in advance by all providers.

Pharmacists working in home care did so through a community pharmacy, home care company, or hospital outpatient setting. In all home care organizations, the pharmacist must act as a vital member of a health care team that cares for patients. This team included nurses, physicians, caregivers, and the patients. The team members worked to together to develop a plan of care that will achieve the desired outcome for the patient's therapy (McCarthy and Schafermeyer, 2010).

Pharmacists provide a wide range of medications, along with health and convalescent aids, for patients at home. Traditionally community pharmacists have been viewed as providers of prescription and nonprescription medications administered orally. Today pharmacists in community and hospital pharmacies across the country have expanded their services for the homebound patient and provide a variety of sophisticated products and services in the patient's home.

Pharmacist involvement in the drug therapy review in older individuals can improve elderly health outcomes (Sorensen et al., 2004). Pharmaceutical care services are now available in many parts of the world, including the United States, United Kingdom, Europe and South America (Rao et al.,2007). The Australian government remunerates accredited pharmacists to formally review non-hospitalized patients in either home medicines reviews or residential medication management reviews (Framework Document for Domiciliary Medication Management Reviews, 2009).

The study of impact of pharmacist-conducted home visits on the outcomes of lipid-lowering drug therapy was performed by Peterson and colleague. The reduction in total cholesterol was expected 21% reduction in cardiovascular mortality risk and

16% reduction in total mortality risk –more than twice the risk reduction achieved din the control group (Peterson et al., 2004).

IV.8 Literature Review in Home Health Care in Thailand

A survey of the health status of 5,882 families in Thailand found that 67% of the surveyed families had 1 to 2 family members, who suffered from a chronic ailment. In average 1.6 chronic diseases were found per family (Wibulpolprasert, 2007).

The study of home health care models of the rural hospital during 1996-2006 had 4 models; the first model was services home health care coordination with social medicine and nursing departments, but without specific support of the home health care unit, the second model was to be carried out by nursing department, with a specific unit supporting, The third model was the social medicine department and specific unit support, and the fourth model was provided as hospital service with specific support of the home health care agency (Porntip Keyuranon, 1996).

The study of home health care quality indicator development for chronic disease for health team should be formulated by the health provider who was responsible for people in that community, training courses for health personnel and caregivers about chronic disease at home and a database or information system derived for chronic disease patients (Orawan Katekaew, 2005).

The frequency of home health care visiting was every month by nurses. The co-operation with health care team was need by chronic care patients. The chronic patients needed health care team (doctors, pharmacist, rehabilitant and others) to support by co-operation, planning health management with patients and continuity program, especially diabetes patients at home. The average cost for services was 65.33 Baht (Pornpan Sabpanboonkit, 2003).

Volunteer-based home care program, integrated to the provision of conventional care of older person at home is another approach for improving the quality of life of the older people (Duangruedee Lasukka and Sudarat Chaiart, 2007)

The home care pharmacy services were conducted in Buawad community health center, Ubonratchatanee province that had many impacts no diabetic patients on increasing patients and care givers attitudes, improving medication adherence, and improving quality of life (Ulayluk Debavalya, 2008).

The study of drug related problems in geriatric patients at home that studied after discharge from hospital, Phrae. The type of problems, rate of occurrence, causes of problem and readmission were study by pharmacists 4 times visiting in house during 1998 to 1999. This study found that the numbers of drug related problems were found 74.1% (1.39 per patient). The numbers of problems and patients were decreased in second visiting. The diabetes patients were 37% readmission with more than 2 times during 7 month period. The home visit by pharmacist reduced the drug related problems by increasing the cooperation about drug usage, decreasing adverse drug reactions and increased the knowledge about their medicines. When the pharmacist visited patients at home, they encountered the patients' lifestyle and environment and could find the problems (Chulalak Chongwiriyanurak, 1999).

The study of drug administration of patients and family by nursing home care told that medical error were related to drug related problems. The patients were more than 2 diseases and 5-6 drugs used per patient. The drug medical error had occurred in patient that received more than 3 drugs (Prasanathikom, 2008).

The study of the cost savings of pharmaceutical care implementation and medication related problems from drugs at medical wards hospital. Pharmacists followed and evaluated patients medications in order to identify, resolve, and prevent medication related problems (Siriprapat .B and Taesothikul W., 2007).

CHAPTER III

METHODOLOGY

This chapter describes details of the study methodology which included study design, population and sample, steps and instruments used in intervention, and data analysis study.

I. RESEARCH DESIGN

This study was an action research using the single group before-and-after design.

II. POPULATION AND SAMPLE

1. Study population and sample

The sample 700 patients with uncontrolled chronic conditions who were defined by nurse home health care for medication therapy management service in communities in Bangkok metropolitan.

1.1. Area Selection

The Bangkok Metropolitan Administrative (BMA) had 68 public health centers which provide the preventive, promotion, curative and community health service especially, home health care service. Nurse home health care teams were responsible for the home health care activities in their catchment areas. Bangkok public health centers were volunteer to participate in this study. They were Bangkok Public Health Centers 15 (Lat Phrao) covering 5 communities, Center 25 (Huai khwang) covering 5 communities, Center 60 (Don Mueang), and Center 66 Lat Pla Khao covering 15 communities. These 34 selected communities were purposively recruited for pharmacist home health care (Appendix I.1).

1.2. Patient Selection

The purposive sampling of uncontrolled type 2 diabetes patients were selected by nursing home health care teams, under Bangkok public health centers, based on profile of patients.

The inclusion criteria for patients were as following:

1. Adult type 2 diabetes patients with uncontrolled according to Diabetes Management Guideline 2008 (Diabetes Association of Thailand)
   1.1. Fasting plasma glucose (FPG) blood level > 126 mg/dl (data report from Bangkok public health centers).
2. Patients who received drugs and treatment for diabetes for at least 3 months.
3. Patients who have poly-pharmacy.
4. Patients who could be contacted by telephone or of whom the care giver could be contacted.
5. Participants who agree to sign a consent form.

The exclusion criteria:

1. Patients who participated with other diabetes clinical trials.
2. Patients who had a cognitive function disorder.

2. Sample size

The sample size was calculated from a formula for determining sample size of Robert V. Krejcie (Krejcie R. & Morgan V., 1970). The Diabetes populations who receive pharmacist home health care were 700 (*N*) that is selected by nursing home health care team. The formula is

$$\text{SIZE (s)} = \frac{X^2 NP\,(1\text{-}P)}{d^2\,(N\text{-}1) + X^2 P\,(1\text{-}P)}$$

s = required sample size.

X^2 = the table value of chi-square for 1 degree of freedom at the desired confidence level

N = the population size.

P = the population proportion (assumed to be 0.50 since this would provide the maximum sample size).

d = the degree of accuracy expressed as a proportion (0.05).

Substituting in the equation:

$$s = \frac{(1.96)^2(700)(0.5)(1-0.5)}{(0.05)^2(700-1) + (1.96)^2 (0.50) (1-0.50)}$$

$$= 248$$

The over-sampling by at least 15% or approximately 285 patients were planned in order to reduce the treat of sample attrition. The study finally used total 288 diabetes patients receiving pharmacist home health care.

3. Pharmacist Selection

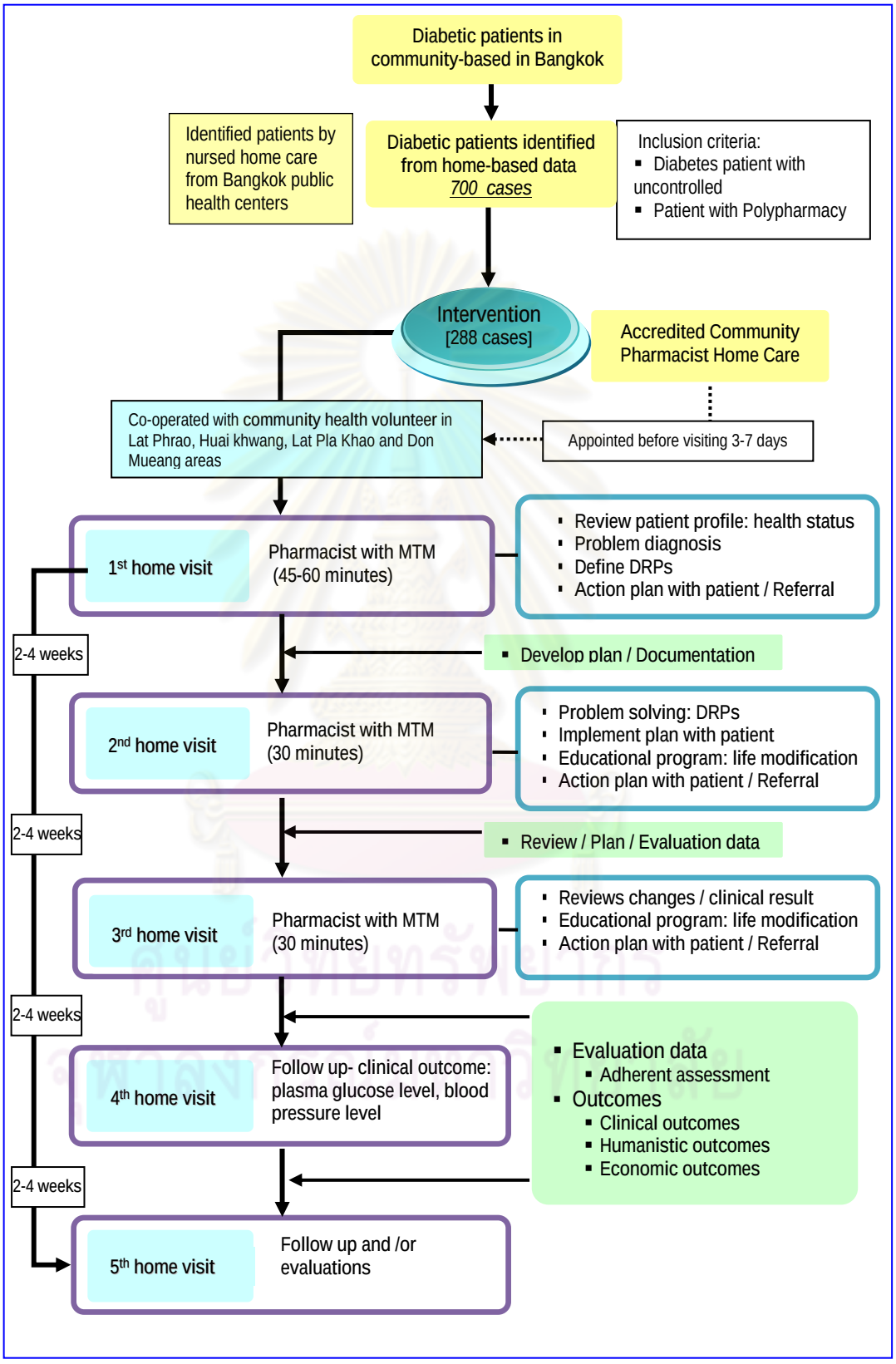
The 10 community pharmacists registered through the Community Pharmacy Association (CPA) (Thailand) by recommendation. The registered pharmacists were located in Lat Phrao, Huai khwang, Lat Pla Khao and Don Mueang areas (Appendix I.2).

The registered community pharmacists attended the pharmacist home health care training program. This training program included basic knowledge of diabetes management, drug related problems management, concept of Medication Therapy Management (MTM) Model and the home health care procedure. The case discussion and experience exchanges were conducted every two months.

4. Duration of Study

This study was started in May 2009 and finished in the end of July 2010.

Figure 4: Intervention schedule and activities



III. STUDY PHASED / APPROACH

Phase I: Preparation

The interventions were medication therapy management service provided for selected diabetes.

1. Medication Therapy Management (MTM)Tools

The steps of MTM services were used as a guideline for pharmacist practice to continuously mention patient medication utilization. The five core elements also formed a framework for data collection of the study. Every core element is integral to the provision of MTM; however, the sequence and delivery of the core elements may be modified to meet an individual patient's need.

1.1 The naming system of Medication Therapy Management tools

The alphabets and naming system of tools were indicated source of data, objective, and type of data as following

The first word indicated the person who assessed the data as

P represented Patient

R represented Registered- pharmacist

M represented Medical professional (Physician)

The second word or middle refereed to objective data as

C represented Counseling

H represented Health

K represented Knowledge

M represented Medication

R represented Referral

S represented Screening

The last word referred to action form

A represented Assessment
E represented Education
G represented Guideline
M represented Monitoring
P represented Profile

For example, PMP refereed to Patient Medication Profile

1.2 The list of Medication Therapy Management tools (Appendix VII):

1.2.1 Tools for medication therapy review consist of
Patient Health Profile (PHP),
Registered Pharmacist Medication Profile (RMP)
Registered Pharmacist Screening Profile (RSP)

1.2.2 Tool for a medication action plan
Registered Pharmacist Medication Profile (RMP)
Registered Pharmacist Screening Profile (RSP),
Registered Pharmacist Counseling Profile (RCP)
Patient Medication Questionnaire Assessment (PMA)
Patient Knowledge Assessment (PKA)

1.2.3 Tool for intervention and referral
Registered Pharmacist Counseling Profile (RCP)
Registered Pharmacist Referral Assessment (RRA)

1.2.4 Tool for documentation and follow-up.
Registered Pharmacist Medication Profile (RMP)
Registered Pharmacist Screening Profile (RSP),
Registered Pharmacist Counseling Profile (RCP)

1.2.5 Tool for a personal medication record
Patient Health Monitoring Book (PHM) for Patients

1.3 Description of tools

The data collecting forms including 5 parts (Appendix VII)

The first part:

The information for patient health profile form (PHP) part were provided / assessed by the patients.

The objectives were contact patients; characteristics including physical, behavioral and social aspects that could affect outcomes.

There were 5 sections as

PHP1: Interviewing the patient to gather data including: basic patient demographic information, social security number, emergency contact person's name, name of health services such as hospital or primary care unit, and patient house's map in each area.

PHP2: General data support: educational and economic status.

PHP3: Behavioral status and daily activities such as exercise, food, social history and number of alcohol drink, smoking, and be stress, the medication and food allergy history, caregiver details.

The general health information was used to support for patient cares such as religion, career, animal, others data.

PHP4: Health status as medical history, and the chief complaint part for more detail.

PHP5: Family health history

The second part:

Registered pharmacist medication profile form (RMP) part was a very useful piece of data to be used to determine if a patient has had a positive or negative outcome and to identify possible drug therapy problems. The RMP form is longer than the others and includes suggested questions regarding previous adverse effects, compliance, and the patient's ability to afford medications.

The objectives were assessing, on the basis of all relevant clinical information available to the pharmacist, the patient's physical and overall health status, including current and previous diseases or conditions. The patient evaluation was used to

detected symptoms that could be attributed to adverse events caused by any of their current medications.

RMP form was filled by a pharmacist that counted the number of pills taken in each tape of medicine for monitoring the patient's compliances and drug related problems in the third visit.

RMP1: Medication history, herbal product, supplement such as vitamins, minerals that were prescribed by physician.

RMP2: Non-prescription medication history, herbal product, supplement such as vitamins, minerals

The RMP1 and RMP2 form were the medication therapy review which includes: Assessing, identifying, and prioritizing medication related problems covered in the areas of

a. The clinical appropriateness of each medication being taken by the patient
b. The appropriateness of the dose and dosing regimen of each medication, including consideration of indications, contraindications, potential adverse effects, and potential problems with concomitant medications.
c. Therapeutic duplication or other unnecessary medications
d. Adherence to the therapy
e. Untreated diseases or conditions
f. Healthcare/medication access considerations

The third part:

The registered pharmacist screening profile form (RSP) part was the patient's laboratory profile. It was a specifically piece of data for monitoring patients and collecting patients' history. The blood pressure level and foot screening were monitored by a community pharmacist in each home visit. The glucose plasma level, HbA1c, and other parameters were pieces of data retrieved from hospital's records (if available). The objectives were interpreting, monitoring, and assessing patient's

laboratory results (if available). The foot assessment was diabetic care requirement in diabetic neuropathy monitor for foot protection.

RSP1: Laboratory data from hospital or primary care unit
RSP2: Foot screening profile for peripheral vascular disease and foot ulcers monitoring by foot monofilament.

The fourth part:

The registered pharmacist counseling profile (RCP) part and registered pharmacist referral assessment (RRA) part

The RCP form was integrated data for developing a care plan for resolving each medication related problem identified. The medication action plan (MAP) was a patient-centric document containing a list of actions for the patient to use in tracking progress for self-management. A care plan was the health professional's course of action for helping a patient achieved specific health goals. The care plan was an important component of the documentation core element outlined in this service model. In addition to the care plan, which was developed by the pharmacist and used in the collaborative care of the patient, the patient receives an individualized medication action plan for use in medication self management.

The objectives of medication therapy review (MTR) were a systematic process of collecting patient-specific information, assessing medication therapies to identify medication-related problems, developing a prioritized list of medication-related problems, and creating a plan to resolve them.

The RCP form recorded the health problems in the part of drug problems, disease problems, and life style problems in definite short word terms. The drug problems were defined in the term of drug related problems (DRPs) category in each medicine and the compliance issue. The disease problems were reported in clinical symptom definite by technical term, such as peripheral neuropathy, postural

hypotension occurs. The lifestyle problems were necessary issue for diabetic patients in order to control glucose level to reach the goal.

RCP1: Problems list (disease problems, medication problems and lifestyle problems), an intervention or action process (medication review, patient education, consulted patient, medication change as prescribe medication)
RCP2: Planning, follow up, solving problems according to RCP1

1.4 The supplement part

1.4.1 The patient record book

The patient record book / patient health monitoring book, which was intended for use by the patient, may include the following information (Appendix IX) as

- Patient name, patient birth date, patient phone number, emergency contact information (Name, relationship, phone number), primary care unit or hospital (Name and phone number), physician or other healthcare professional
- Medical history such as the allergy or reaction with any drug, food.
- Other medication-related problems
- The appointment with physician
- For each medication, inclusion of the following:
    a. Medication (e.g., drug name and dose)
    b. Indication (e.g., Take for…)
    c. Instructions for use (e.g., When do I take it?)
    d. Start date / Stop date
    e. Special instructions

1.4.2 Guideline and criteria

1.1 Drug related problems criteria guideline for pharmacist (Appendix II.1).

1.2 Knowledge Guideline for Community Pharmacy which was guideline for service support for education to patients and care givers (Appendix X).

2. Pharmacist preparation

2.1 Training for pharmacists' standardization

Home health care pharmacists were accredited and registered through the Community Pharmacy Association (Thailand) to perform medication therapy management (MTM) services. Pharmacist home health care team attended pharmacists training program.

The program training topics were as following:

2.1.1 Basic knowledge: diabetes management program that aimed to update guideline of medication treatment for diabetes patients.

2.1.2 Drug related problems classification and solving problems

2.1.3 Medication Therapy Management concept- 1 day

2.1.4 Home health care procedure and case-based learning practice 1 day

2.1.5 Case discussion every two months

2.2 Supplies and appliances instrument for pharmacists

The pharmacist home health care's instrumental was used in the purpose of monitoring and assessing the process. The pharmacist bag consisted of

2.2.1 A blood pressure monitor (for monitoring)

2.2.2 A foot monofilament (for disease assessment)

2.2.3 A medicine tray (for medicine assessment)

2.2.4 Brown plastic pill bags, plastic pill bags and stickers for labeling (for rewrite label)

2.2.5 A pharmacist home health care practice guideline (data record detail for pharmacist)

2.2.6 A knowledge guide for community pharmacists (educational material support for patients such as diabetic disease, hypertension, food controlled and drug identify)

2.2.7 Patient profile files (for data collection) see appendix

Phase II: Provide MTM services

The intervention was an individual based approach for medication therapy management services. The pharmacist was educated and trained on the appropriate use of medications and monitoring devices and the importance of medication adherence and understanding treatment goals. The coaching patients were encouraged to manage their medications. The monitoring and evaluating were the patient's response to the therapy, including safety and effectiveness. The pharmacist assessed the patient's medications for the presence of any medication-related problems, including adherence, and worked with the patient, the physician, or other healthcare professionals to determine appropriate options for resolving identified problems**.**

Interventions included collaborating with physicians or other healthcare professionals to resolve existing or potential medication-related problems or working with the patient directly.

1. **Planning for visit and interventions**

1.3 Cooperation with nurse home care team in Bangkok public health centers to retrieve selected uncontrolled type 2 diabetes patient profiles. The patients' house map and telephone number of volunteer health village in each area were also prepared by nurse home health care team.

1.4 Plan for visiting: Pharmacist home health care directly appointed the volunteer health village in each area or patients 1-3 days prior for in every visit. The pharmacist prepared the patients' profile if available from the previous visit. The patient's medication profiles and medication-related problems were reviewed.

2. **Intervention and home health care process**

2.1 The procedure for a pharmacist's visiting as following

2.1.1 Self introduction and the introduction to the project information must be appropriately done. This explain the objectives of interview and how to the patient or caregiver might benefit from pharmacist's home care. The patient consent form was required to be signed.

2.1.2 The interview was started from general information, behaviors; verify the patient's allergies and history of medication intolerance.

2.1.3 Retrieving some information by seeing all containers of medication must then do. This includes including prescribed medication, over-the-counter products, natural products, and vitamin. The pharmacist asks how the patients take their medication, verifies the patient understanding on their medication, including the name and the indication and the goals of therapy.

2.1.4 For each medication, the pharmacist checks whether there is a concordance between the date of the last renewal and the quantity of remaining medication. This is to confirm how the patient actually takes the medication, how many times and at what time dose the patient take it, and to ensure concordance with directions on the label.

2.1.5 The pharmacist will discuss with the patient of what to do if the patient forgets to take as started.

2.1.6 The pharmacist helps determining determine objectives or steps to be taken to solve medication problems and intervention. With the patient's permission, the pharmacist removes expired or useless medication and makes a list of all medications used by completing the form.

2.1.7 The pharmacist notes problems identified during home health care visits defines the clinical problems, and drug related problems, lifestyle problems. The pharmacist must retrieve document data about intervention to solve problems and pharmaceutical care plan for the next visit used by completing the registered pharmacist counseling profile (RCP1-RCP2) form.

2.1.8 The pharmacist, finally, inform the correspondent to physician by referral form as the problems might affect the clinical outcome

2.2 Documentation

MTM services were documented in a consistent manner, and a follow-up MTM visit was scheduled based on the patient's medication-related needs, or the patient was transitioned from one care setting to another.

The documentation of MTM services served several purposes including the following:

- Facilitating communication between the pharmacist and the patient's other healthcare professionals regarding recommendations intended to resolve or monitor actual or potential medication-related problems
- Improving patient care and outcomes
- Enhancing the continuity of patient care among providers and care settings

2.3 Education for patient

The education and knowledge materials for patients used the knowledge guide for community pharmacist handout (Appendix X). The objective was to improve the knowledge in part of patient's problems that involved the controlled disease.

The educational material support for patients was the knowledge guide for community pharmacists handouts including topics such as diabetic disease, hypertension, food controlled and drug identify. In addition, the pharmacist supplied the patient with education and information to improve the patient's self-management of medications.

2.4 Follow up

The continuity of care should be follow up for disease problem management, prevention, and protection. The patient's disease would prolong the progression of disease by pharmacist home health care in the part of medication management. The timing and frequency of visiting was important for monitoring.

2.5 Referral

The pharmacist provided consultative services and intervenes to address medication-related problems; when necessary. The pharmacist referred the patient to a physician or other healthcare professional.

The objective was to resolve the patient's problems by communicating and cooperating with physicians or other professionals via a registered pharmacist referral assessment (RRA) form.

The intent of intervention and/or referral was to optimize medication use, enhance continuity of care, and encourage patients to avail themselves of healthcare services to prevent future adverse outcomes. The communication of appropriate information to the physician or other healthcare professional, including consultation on the selection of medications, suggestions to address medication problems, and recommended follow-up care, is integral to the intervention component of the MTM service model.

The fifth part:

This part had a person medication record or patient record book, which was a comprehensive record of the patient's health information, medications, herbal products, and other dietary supplements.

The objective was pharmacists used the patient record book to communicate and collaborate with physicians and other healthcare professionals to achieve optimal patient outcomes. The patient record book supported uniformity of information provided to all healthcare professionals and enhance the continuity of care provided to patients while facilitating flexibility to account for pharmacy- or hospital-specific variations.

3. Time allocation during the visit

3.1 The 1st visit taken about 45-60 minutes for collecting patient data, medication therapy review, defining the problems, resolving the problems from drug related problems. The collecting data forms were patient health profile (PHP1-PHP5), registered pharmacist medication profile (RMP1-RMP2), registered pharmacist screening profile (RSP1-RSP2), registered pharmacist counseling profile (RCP1-RCP2), patient medication assessment (PMA), patient knowledge assessment (PKA1-PKA2) and registered pharmacist referral assessment (RRA) especially, referral cases.

3.2 The 2nd visit takes about 30-40 minutes for collecting patient data, medication therapy review, defining the problems, resolving the problems from drug related problems. The collecting data forms were registered pharmacist medication profile (RMP1-RMP2), registered pharmacist screening profile (RSP1-RSP2), registered pharmacist counseling profile (RCP1-RCP2), and registered pharmacist referral assessment (RRA) especially, and referral cases.

3.3 The 3rd visiting spent the time 30 -40 minutes. The collecting data forms were registered pharmacist medication profile (RMP1-RMP2), registered pharmacist screening profile (RSP1-RSP2), registered pharmacist counseling profile (RCP1-RCP2), and registered pharmacist referral assessment (RRA) especially, and referral cases.

3.4 The 4th, 5th visits are to for follow up and monitor patient. These collected data were using registered pharmacist medication profile (RMP1-RMP2), registered pharmacist screening profile (RSP1-RSP2), registered pharmacist counseling profile (RCP1-RCP2), and registered pharmacist referral assessment (RRA) especially, and referral cases.

4. The interval of visiting

The interval of follow up is approximately 1-4 weeks this depends on clinical symptom of the patients, severity of problems, side effect occurred, the remaining problems.

Phase III: Outcome Measurement

1. The problems were defined in 3 categories:

1.1 Clinical problems

The clinical problems occurred from diabetes diseases were complex. The high/low blood glucose levels in patients were risk of diabetes patients. The clinical symptoms were subjective indication of a disease or a change in conditions as the diseases. These parts should provided this support by

exploring common clinical problems in diabetes care, and providing practical solutions based on evidence and consult to physicians.

1.2 Drug related problems

The drug problems issues that concerned the problems from the drugs for treatment diseases according to drug related problems categories from Strand LM, et al (1990). There were 8 main issues that defined the problems in each items such as adverse drug reactions; the side effects of medications, and the uncertainties of compliances issues.

1.3 Life-style problems

The main problems of diabetes patients were lifestyle that included food, drinking, exercise, sleeping, stress and any behaviors. These problems were difficult to change and took time for behavior improvement. The caregivers and health professional gave the empowerment to patients for improve the outcomes. The life-style problems lists were important for assessment, planning, solving the problems with patients and care givers.

2. The evaluation of outcome will be focus on patient perspective

1. **Intermediated outcome measure** ; adherence rate

   To improve adherence level in diabetes patients

2. **ECHO Model** (Kozma C.M. & Reeder C.E., 1993)

   2.1. Economic outcome (E)

   Excessive drug costs were calculated by excessive numbers of drugs (only actual prescription drug) that pill counts were collected in each visiting and calculated with drug pricing as the National Price index.

   2.2. Clinical outcomes (C)

   2.2.1. Fasting plasma glucose(FPG) blood level < 126 ml/dl

   2.2.2. Number of drug related problems solving (compliance solving)

   2.3. Humanistic outcome (H)

2.3.1. Patient satisfaction by questionnaire (Appendix VIII.1)

The patient satisfaction questionnaires were collected at the end of study. The satisfaction of pharmacist service using a 5 –point Likert scale was scored from 1 (least) to 5 (most) in 25 items. The results of internal consistency reliability coefficients (Conbrach's Alpha) of attitude and practice questions were satisfied (Appendix IV.1).

2.3.2. Diabetes patient quality of life is modified from Diabetes Control and Complication Trial (DCCT) (National Diabetes Information Clearinghouse; The DCCT research Group., 1988). See Appendix IV.2,IV.3.

These were self-administration questionnaires (Appendix VIII.3) in three subscales as 1) satisfaction with diabetes treatment, 2) impact of treatment diabetes, and 3) worry about the future effect of diabetes. Items were scored on a 5-point Likert scale and are of two general formats and were scored from 1(never) to 5 (all the time) and 1(satisfied) to 5 (dissatisfied). The results of internal consistency reliability coefficients (Conbrach's Alpha) of each dimension were done separately.

3. The adherence / compliance assessment

The compliance / adherence rate were assessed from pill counts as the medication monitoring. Pill counts could represent the adherence as well; particularly the medication was taken on schedule of prescription.

The compliance or adherent calculation formula as:

Compliance (%) =

$$\frac{\text{(Number of pills in the first visit – Number of pills in second visit) x 100}}{\text{The total number of pills that should be taken as prescribed}}$$

- Number of pills in first visit = sum of number of pill counts plus number of pills was taken
- Number of pills in second visit = sum of number of pill counts plus number of pills was taken and number of pills from new refill from hospital

- The total number of pills that should have been taken as prescription = multiply of numbers of pills by number of days between visit
- The data error meant the different of the number of pills in each visit more than prescription interval.

IV. DATA ANALYSIS / ASSESSMENT

Standard statistical analyses were used, including parametric and nonparametric measures where appropriate. Descriptive statistics were used to characterize the findings at each time point and changes over time were evaluated with paired t-test for parametric and Wilcoxon signed ranks test for non-parametric variables. Probability values are reported without regard to multiple comparisons and represent two-tailed tests. The major endpoints for comparison were annual follow-up from baseline, although the 6 month follow-up is displayed if these were the only data available. The last recorded data point for each individual is reported as "end-of-follow-up. For the clinical data this was easily established by using their enrollment date and subsequent annual evaluation dates thereafter. Data management was performed with Microsoft Access and statistical analysis with SPSS version 11.0.

V. ETHICAL CONSIDERATIONS

The study was approved by the Ethical Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University, Thailand before collecting data. All participants provided their formally consent by signing a written consent form prior to the study. Verbal information was given to the individual patient or caregivers before the interventions. All information of the study cases was kept confidential using pharmacist performing in order to protect human rights. The individual was free to refuse to participate and free to withdraw from the research at any time without penalty or loss of benefits to which he or she would otherwise be entitled.

CHAPTER IV

RESULTS

The data in this thesis is presented in four sections; the first is the results of data collections and clinical. The secondary section presents the Chronic Care Model (CCM) and Medication Therapy Management (MTM) Service Results. The last section showed the outcome results; intermediate outcome and describes evaluation of outcome as ECHO model (Kozma, C.M. and Reeder, C.E.,1993). the third section is drug related problems data.

I. CHARACTERISTICS

The home health care service by community pharmacists was carried out in 34 community-based areas in Bangkok Metropolitan during May 2009 to July 2010. This study purposively selected diabetic patients from the four communities including Lat Phrao, Huai khwang, Lat Pla Khao and Don Mueang areas.

Diabetes that was unable to control their symptoms within selected areas by the nurse home health care team was identified and referral to community pharmacists from pharmacy home health care. Among registered patients, 288 patients were chosen from 700 cases. Most of the cases were female, in the age of over 60 years (82%) whose income were less than 10,000 Baht per month (81%) as shown in Table1. The number of drug per patient was no more than 17 drugs, and the mean was 7.1 (SD 3.0) drugs per patient. The level of mean (SD) systolic/ diastolic blood pressure were 139.6 (20.7) /79.2 (11.2), and 150 (SD 54.7) mg/dl of fasting blood glucose level (only data from primary care unit). There were 263 cases 91.3% completed 3plan home health care, while 8.7% lost follow up.

Table 1, presented demographic background of characteristic that age was 66 (mean). The insurance health care cards were 55.9% universal coverage card, 27% government officer. As a consequence, the number of drugs per patient has the mean of 7.1, with maximum of 17 drugs.

Table 1: Demographic and clinical characteristics

Characteristics	Statistical	N (288)	%
Gender			
Female		217	75.4
Male		71	24.6
Age (Year)			
Mean (SD)	66 (9.4)		
Minimum age	40		
Maximum age	91		
40 – 49		13	4.5
50 – 59		52	18.1
60 – 69		121	42.0
≥ 70		102	40.6
Income per month (Baht)			
< 10,000		233	81.0
10,000 - 30,000		54	18.7
> 30,000		1	0.3
Education			
Less than high school		187	64.9
High school and higher		101	35.1
Insurance health care card			
Universal health coverage		161	55.9
Government officer		78	27.0
Self payment		20	6.9
Social security care		12	4.2
Others		17	6.0
Numbers of drugs per Patient			
Mean (SD)	7.1(3.0)		
Minimum	2.0		
Maximum	17.0		
Baseline blood pressure level (mmHg)			
Systolic blood pressure mean (SD)	139.6(20.7)		
Diastolic blood pressure mean (SD)	79.2(11.2)		
Baseline fasting blood glucose level (mg/dL) (N=141)			
Mean (SD)	150(54.7)		

Table 2, presented demographic background of medical history from patients who had hypertension (81.6%), dyslipidemia (58.0%), cardio-vascular disease (63.7%), and other diseases found in elderly. There were more than two co-morbidities in each patient, i.e., diabetes with hypertension and dyslipidemia (37.3%), diabetes with

hypertension (28.8%), and diabetes with hypertension, dyslipidemia and cardiovascular disease (12.8%).

Table 2: Disease status

Disease Status	N (288)	%
Morbidity		
Diabetic Mellitus	288	100.0
Hypertension	235	81.6
Dyslipidemia	167	58.0
Cardio-Vascular Disease	48	16.7
Gout	23	8.0
Osteoarthritis	19	6.6
Asthma	13	4.5
Cataract	10	3.5
Glaucoma Others (prostatism , glaucoma, depressant)	12	4.1
Co-morbidity		
DM only	29	10.1
DM with HTN	83	28.8
DM with Dyslipidemia	21	7.3
DM with CVD	1	0.3
DM with HTN and Dyslipidemia	107	37.3
DM with HTN and CVD	8	2.8
DM with Dyslipidemia and CVD	2	0.7
DM with HTN, Dyslipidemia, and CVD	37	12.8

DM = Diabetes Mellitus, HTN= Hypertension, CVD= Cerebro -Vascular Disease

The table 3 showed, the study of patient behavior health status found that 48.9% of the patients, were in stress and 17.4 % had quit smoking of more than 5 years. The study also showed that 71.2% of the patients had never drank alcohol while only 10.4% occasionally drunk. Coffee and tea were the favorite drink in communities. There were 45.2% drinking coffee regularly, and 31.2% drinking tea. The study exhibited that sweet in 28.8% of patients and salty in 27.8%. The main problems depended entirely upon Thai life-style, which means having sweet Thai desserts or sweet fruits such as Mango, Durian, Logkan available in each season.

The food and medication were important parts in diabetes management. The results showed that food management was achieved in the rate of 69.1% by self management; otherwise 30.9% were taken care of by a caregiver, such as husband, son, and daughter. The food education planning for caregivers were conducted.

However, the medication was managed individually in the 84.3% of patients, showed in Table 4.

Table 3: Behavioral health

Behavioral Health	**N (288)**	**%**
Stress		
No stress	147	51.1
Seldom	113	39.2
Regularly	28	9.7
Smoking		
Non-smoking	224	77.8
Quit smoking > 5 years	50	17.4
Smoking 10 cigarettes/day more than10 years	8	2.8
Smoking < 10 cigarettes/day not identify period	3	1.0
Smoking < 10 cigarettes/day more than 1 year	3	1.0
Alcohol drinking		
Never	207	71.2
Quit	47	16.3
Occasional	30	10.4
Regular	4	1.4
Regular more than 1 bottle	2	0.7
Coffee drinking		
Non drinking	95	33.0
Quit	18	6.2
Occasional	45	15.6
Regularly 1 cup per day	110	38.2
Regularly more than 1 cup per day	20	7.0
Tea drinking		
Non drinking	190	66.0
Quit	8	2.8
Occasional	58	20.1
Regularly 1 cup per day	14	4.9
Regularly more than 1 cup per day	18	6.2
Food Taste		
Sweet	83	28.8
Plain	81	28.1
Salty	80	27.8
Sour	23	8.0
Spicy	16	5.6
Oily	5	1.7

Table 4: Medication and food management of patients

	Medication Management		**Food Management**	
(N 288)	**N**	**%**	**N**	**%**
By patients	243	84.3	199	69.1
By caregivers	45	15.5	89	30.9

Non-prescription drugs were the drugs, herbals; vitamin and mineral supplement that patient's self-medication from drugstore any sources. There was a large amount of patients taking additional drugs to treat their conditions for example vitamins and mineral supplements, and many non-prescription drugs, including the herbals were distribute in several communities such as Moringa oleifera Lam (Ma Rum,มะรุม), Gynura divaricata DC (Papk Tum Puin, แป๊ะตำปึง หรือ ต้นจักรนารายณ์), Oryza sativa (Rice Bran Oil, น้ำมันรำข้าว).

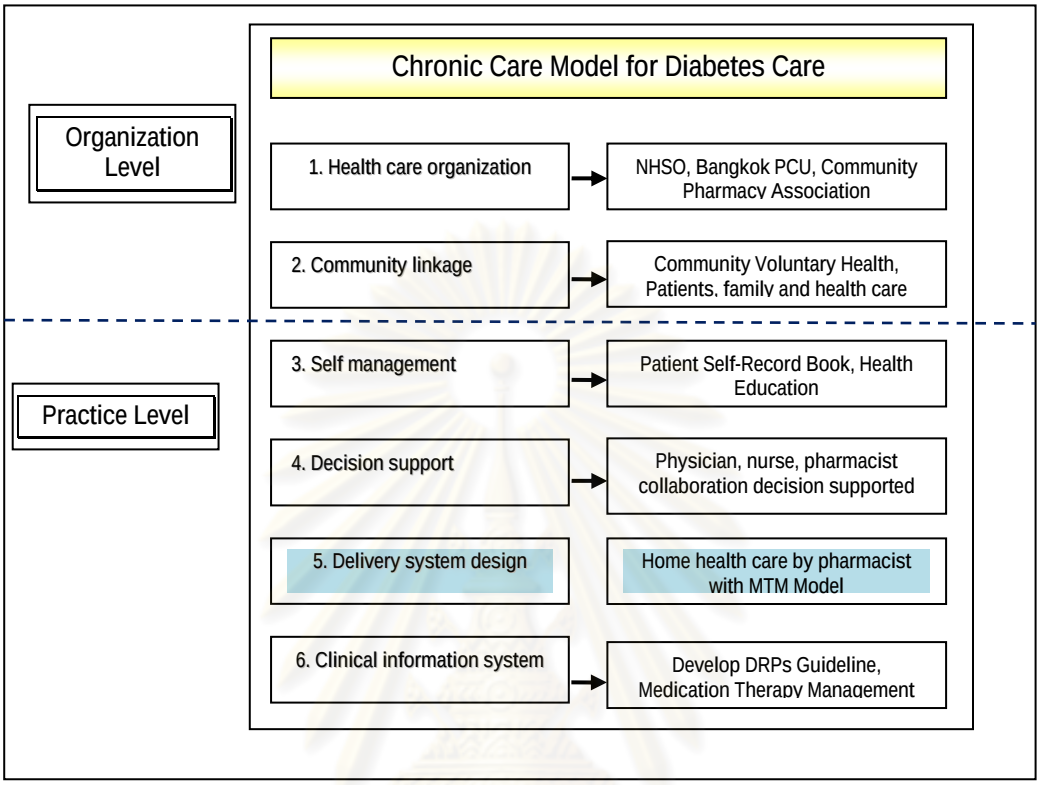
In addition, the patients received Thai-or Chinese traditional medicines from temple and any sources which have not registered. The information of Thai herbal medicines was advertised through radio, cable television, brochure, and direct sale marketing to patients. As a consequence, patients stopped the medicines or treatment from their hospitals causing experiencing the problems on clinical outcomes.

II. CHRONIC CARE MODEL(CCM) AND MEDICATION THERAPY MANAGEMENT (MTM) SERVICE RESULTS

The chronic care model (CCM) has developed a model for primary care of patients with chronic illness therefore a guide to be used in developing effective chronic care, see Figure 2. This study was integrated medication therapy management services by pharmacist home health care as one of elements in CCM for diabetes care.

The CCM consisted of the essential six elements could identify in two levels as the organization level, and practice level. The organization level was community resources and policies, and health care organization. The practice level was self-management support, delivery system design, and decision support, and clinical information system, sees Figure 5.

Figure 5: Integrated Medication Therapy Management service in Chronic Care Model



1. The organization level

1.1 Health system; there were many health care organization involved in the processes including Bangkok PCU, NHSO, and Community Pharmacy Association.

1.1.1 Bangkok PCU provided the study team information such as names and addresses of patients and volunteers, but health information was not given by the organizations. In addition, the organization sent a nurse team to help the study team in the first visit. The nurse team was familiar with the patients, the village health volunteers and the areas so the work was done smoothly and securely.

1.1.2 The study could be sustained due to financial supports from NHSO. The main funding in this study came from NHSO and it is also a major which allows the project to be carried out.

Without the name of NHSO, patients and other parts of the study model might not have cooperated with the visiting team as such.

1.1.3 Community Pharmacy Association played an important role in driving new pharmacy innovations; as a result, the organization supported both the study in the primary care level and financial. The association also can expand new role and recruit the new pharmacies to get involved in the visiting; therefore, there were more visiting pharmacist staffs in the team and then more pharmacists realized of how home visiting could be important.

1.2 Community resources and policies

The provider organizations need linkage with community-based resources, for example, village health volunteers in each community with community pharmacist home health care team. Human resources; including pharmacists home health care, nurses home health care and village health volunteers, seemed to be the core component in this study.

1.2.1 Home health care nurses acted as a case manager in the sense of health care. The nurses linked between other resources and the community and the patients were then treated better. After each visits, the health information gained by the study team was transferred back to the nurse team so that they could make use of the information.

1.2.2 Village health volunteers were the closest resource to the patients. With a good link to this resource, the patients could be helped quicker and better than other human resources. Furthermore, the volunteers could help informing the health care team in case of a patient needed an emergency help from the team. Lastly, they also helped promoting the service held by the health care team so that patients could understand and

wanted to participate in the services. Therefore, the volunteers acted as an area manager in the sense of cooperating with the patients.

1.2.3 Pharmacists home health care detected drugs related problems, solved drugs related problems within the scope of what the pharmacists could, and then transferred drug related information to the nurses home health care in order for the nurses to be able to take better care of their patients.

2 The Practice Level

2.1 Self management support

Self management support empowered patients so that they had awareness and knowledge of how to take good care of their illnesses. It also built up self confidence and self management of their daily lives. After the acknowledgement, patients tended to take their medications and thus could control their conditions in an acceptable level.

Furthermore, the personal medication record handbook given to patients could help recording health information including drugs and other lab result. The book also allowed a linkage among the pharmacists, the patients and the physicians because they all had to monitor and record in the book.

Lastly, the book acted a health reminder and organizer. It is undeniable that with the knowledge of self health care is one of the most important points. Giving knowledge to the patients, their family and care givers helped them controlling their condition better because these people knew how to take care of patients or themselves, what to cook for, and when to take medications.

2.2 Delivery system design

The delivery system design was built on the basis of MTM service through home visiting. The designed system allowed pharmacists home health care to realized drugs related problems from medication therapy reviews, to complete drug information in the individual health system from medication records, to create individual goal plan with the patients so that they were aware of how important their medication were to achieve the goal from action plans, to give drug related knowledge to the patients and to solve remained problems which needed immediate responses from intervention and referral, and finally to be able to track patient conditions and treatments from documentation and follow-up.

2.3 Decision support

This component provided guideline on knowledge support for patients using Knowledge Guide for Community Pharmacists that the guideline helped supporting clear decisions on helping knowledge of diseases, nutrition such as, see Appendix X. The solving problems for the pharmacists such as drug related problems guideline see Appendix II, laboratory guideline, identify medication guideline and drug information guidelines in Knowledge Guide for Community Pharmacists, and see Appendix X. These were using guideline for decision support in home health care process. The pharmacist home health care were built competency by training course. The case / problem- based learning were integrated in this program for strong confidence on home health care services. This training program purposed to motivate and standardize of pharmacist home health care.

The expertise pharmacist team was supported on clinical, social education, and practice in process. The pharmacist home health care team was corroborated with nurse home health, physician and pharmacist in Bangkok public health centers for patients' clinical problems solving.

2.4 Clinical information systems

This study was lack of clinical information from hospital and primary care units. The clinical information was important for continuity of care of pharmacist home health care process.

The response form was the device tool for linkage between health care providers, see Appendix VII. This study was used the patient health information for feed back to nurses and physician by referral form of pharmacist home health care. It then helped the nurses to follow up the problems and illnesses. It also helped the physicians to plan a better treatment when the current treatments are not suitable.

III. OUTCOME RESULTS

1. Intermediate outcome

1.1. Medication Adherence and Compliance

Medication adherence (compliance) refers to the act of conforming to the recommendations made by the provider with respect to timing, dosage, and frequency of medication taking. Therefore medication compliance may be defined as the extent to which a patient acts in accordance with the prescribed interval and dose of a dosing regimen. Compliance is measured over a period of time and reported as a percentage (Cramer, J.A. and Roy, A., 2008)

The adherence rates were typically higher among patients with chronic conditions which were disappointingly low, and dropped most dramatically after the first therapy. The assessment adherence tool used to indirectly measure was pill counts. However, the pill counts could misrepresent adherence as well, particularly when they failed to measure whether medication was taken on schedule.

The non-compliance patients led to uncontrollable diabetes. The compliance issues (patient aspect) were classified into various problems in Table 5, in the first visit, the results showed that there was 41% of inappropriate medicine storage, 22% of not taking the medication as directed by the prescription, 19.2% of forgetting to take the medication as directed by the prescription, and 9.6% of stop taking medicine without the doctor's permission, and 2.85compliance problems per patient. The pharmacist home health care had closely relationship with patients in the second visit therefore more number of problems could identify.

As a result, the compliance problems in third visit was reduced so that a large numbers of patients started to take the medication as directed by the prescription, stop taking medicine without the doctor's permission, met with the doctor as appointed, used the medication in an appropriate amount stored medicine. Alternatively, the pharmacists found that the number of problems in forgetting to take the medication and lack of medicine were increased. The number of lack of medicine problems and forgetting to take the medication problems could be defined by pharmacist home health care. These problems were not reduced due to the patients' belief and motivation which used their attention from pharmacists before problems could be identified and solved.

The examples of problems were that patients had forgotten or chosen not to inform their physicians that they were taking some drugs. Several patients had failed to continue a drug that physicians had prescribed in a short period of time. There were some cases where patients took two generic forms of the same drug. Patient did not realize the importance of the indicated usage.

Table 5: Number of compliance problems

Compliance Problems Description	1st visit		2nd visit		3rd visit	
	N	%	N	%	N	%
	288		274		263	
1. Not taking the medication as directed by the prescription	181	22.0	136	15.4	100	14.6
2. Forget to take the medication as directed by the prescription	158	19.2	376	42.5	303	44.3
3. Stop taking medicine without the doctor's permission	79	9.6	43	4.9	30	4.4
4. Lack of medicine	18	2.2	74	8.4	50	7.3
5. Not meeting with the doctor as appointed	27	3.3	23	2.6	10	1.5
6. Excessive use the medication ; herbal, food supplement	22	2.7	12	1.4	7	1.0
7. Inappropriate medicine storage	337	41.0	221	25.0	184	26.9
Total Compliance Problems	**822**	**100**	**885**	**100**	**684**	**100**
Compliance problems per patient	**2.85**		**3.23**		**2.6**	

The adherent rate levels were adherent for three categorized patients as

1. Adherent means medication adherent level ≥ 80%
2. Partially adherent means medication adherent level ≤ 60 - <80 %
3. Non-adherent means medication adherent level < 60%

The study found that patients with age over 50 years old had 40-51 % in non-adherent rate. Those taking drugs more than 7 items of medications had 47-100 % non- adherent rate. Table 6 showed that as items of medication increased, the adherent rate decreased. The non-adherent rate was also increased in elderly or as age increased.

There were many possible reasons of why the diabetes patients quit taking drugs, stopped getting medication. They were; could not understand label, and being unaware of how important the medications were the belief that the medicines might harm them in some ways, e.g. they believed that drugs could be destroy kidney, liver and lead to premature death. These reasons had let patients to stop taking medications and chose herbal medications as means for their treatment.

Table 6: Adherence levels with age and numbers of drugs

Variable (N[a] = 236)	n	Adherence levels			P Value [a] P<0.05	Chi-Square
		Adherent n = 65 (27.5%)	Partially adherent n = 67 (28.4%)	Non-adherent n = 104 (44.1%)		
Age (year)						
40 - 49	9	5 (55.5)	1 (11.1)	3 (33.3)	0.264	2.667
50 - 59	45	11 (25.4)	11 (24.4)	23 (51.1)	0.041	6.400
60 - 69	102	29 (28.4)	27 (26.5)	46 (45.1)	0.041	6.412
70 - 79	70	16 (22.9)	26 (37.1)	28 (40.0)	0.170	3.543
>= 80	10	4 (40)	2 (20.0)	4 (40.0)	0.670	0.800
Number of drug						
1 - 3	20	8 (40.0)	5 (25.0)	7 (35.0)	0.705	0.700
4 - 6	83	27 (32.5)	27 (32.5)	29 (34.9)	0.953	0.096
7 - 9	85	23 (27.0)	22 (26.0)	40 (47.0)	0.027	7.224
10 - 12	34	7 (20.6)	8 (23.5)	19 (55.9)	0.020	7.824
13 - 15	12	-	5 (41.7)	7 (58.3)	0.564	0.333
> 15	2	-	-	2 (100.0)	-	-

[a] Number of patients who had completely pill counts in 3 visits and exclude error data
[b] Paired sample t-test

Among 263 patients who got MTM service by pharmacist home health care, there were only 236 patients that achieved three visits. Among those 236 patients, 65 were adherent, 67 were partially adherent, and 104 were non-adherent.

The change of adherent level after MTM in Table 7 showed that some of the patients who were non-adherent before intervention became adherent (18.2%) or partially adherent (26%) afterward. The partially adherent were adherent afterward (32.8%). However, 55.8% of non-adherent group did not proven on the adherent level.

Table 7: Adherence levels prior to and after pharmacist home health care service

N[a]=236 Adherence Level baseline	The change stage of adherence level after MTM service at home		
	Adherent (%) (n=66)	Partially adherent (%) (n=70)	Non-adherent (%) (n=100)
Adherent (n=65)	38.5%	32.3%	29.2%
Partially adherent (n=67)	**32.8%**	32.8%	34.4%
Non-adherent (n=104)	**18.2%**	**26.0%**	55.8%

[a] Number of patients who had completely pill counts in 3 visits and exclude error data

The co-morbidity was the main problems in diabetes. As a result, the study found that 53.5% of the patients had more than two co-morbidities. Hypertension and

dyslipidemia were the main co-diseases with 36%. The hypertension was the major of co-morbidity (82.9%) (Table8).

The average numbers of drugs that a patient had to take were ranged from 7 to 11 for diabetes with more than two co-morbidities. The adherent average (SD) was 58.5% (27.2) thus the evidence exhibited a significantly high non-adherent as co-morbidities. Furthermore, the adherent level was less than 33% in all groups. The non-adherent level increased as the numbers of co-morbidities.

Table 8: Adherent level and number of drugs with co-morbidity

Co-morbidity	N[a] (245)	%	Number of drug average(SD)	%Adherent average (SD)	Adherent Level (%)		
			Mean 7.1(3.0)	58.5 (27.2)	Adherent	Partially adherent	Non-adherent
DM only	22	9.0	4.5 (2.0)	47.6 (28.8)	27.3	0.9	63.6
DM with HTN	73	29.8	6.4 (2.8)	58.7 (28.2)	31.5	20.5	47.9
DM with Dyslipidemia	18	7.3	5.7 (3.3)	64.8 (27.7)	22.2	55.6	22.2
DM with CVD	1	0.4	7.0 (0.0)	84.0 (0.0)	100.0	0.0	0.0
DM with HTN and Dyslipidemia	90	36.7	7.6 (2.5)	58.8 (26.4)	23.3	32.2	44.4
DM with HTN and CVD	6	2.5	10.2 (4.4)	74.1 (16.5)	33.3	50.0	16.7
DM with Dyslipidemia & CVD	1	0.4	11.0 (0.0)	47.4 (0.0)	0.0	0.0	100.0
DM with HTN, Dyslipidemia and CVD	34	13.9	9.6 (2.0)	57.8 (25.2)	26.5	29.4	44.1

[a] Number of patients who had adherent assessment at 2 times for visiting

2. Clinical outcome

The clinical outcomes assessed in this study were changes in blood pressure level, fasting plasma glucose and the percentage of patients at their goal for each of these parameters. In addition, the percentage of patients with fasting plasma glucose as stated in Diabetes Management Guideline 2008 (Diabetes Association of Thailand) and blood pressure level stage as asserted by the Seventh Report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure (JNC 7) guideline.

2.1. Diabetes result

As a consequence, this study found that the data of fasting plasma glucose level were collected from Bangkok public health centers. There were only 77 patients who had completed the results. The glycated hemoglobin or hemoglobin A1C (HbA1C) outcomes could not be collected from hospitals and primary care units due to some limitation. Therefore, the clinical profile for the drug monitoring could not access in this study.

The results were the average fasting plasma glucose levels higher than 126 mg/dL were not significantly reduced (3.5%) from baseline. However, this study was such a short period of care that the diabetes patients were not able to control or improve the outcome. The result might have been change if the service of care had continued. Thus, the care providers as community pharmacists should continue giving services concerning the medical management to diabetes patients in communities or at home.

The key of success for diabetes cares were patient profiles that must be forwarded to health care providers in order to support their work. Nevertheless, the referral systems were not linkage between the secondary, tertiary care with primary care units, and therefore it led to a lack of patient profiles as clinical data or drugs profiles. The HbA1c data had only 10 patients' available data from Bangkok public health centers. The clinical data were not linkage between the tertiary care and primary care therefore; this study had no target to achieve in HbA1c results.

Table 9: Average of fasting plasma glucose level in visit

Fasting plasma glucose level	**N [a] = 77 (%)**	**1st average FBS [b]**	**3rd average FBS [b]**	**P Value [c] P< 0.05**
≤ 126 mg/dL	30 (39.0)	110.4±14.0	128.2±42.1	0.043
> 126 mg/dL	47 (61.0)	165.5±33.9	159.9±49.6	0.378

[a] Only patients' data from BKK Public Health centers had between study
[b] The average fasting plasma glucose were available during study , [c] Wilcoxon signed ranks test

2.2. Hypertension result

The Seventh Report of Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure (JNC7) guideline classified stage of blood pressure to 4 stages; normal, pre hypertension, hypertension stage 1, and hypertension stage 2. The treatment guideline of hypertension required two medications to reach the goal of maintaining the blood pressure <140-90 mmHg or blood pressure or < 130/80 mmHg in patients with diabetes.

The results presented the percentage of patients who were (38%) pre-hypertension, (32%) stage I hypertension and (16%) state II hypertension. The average systolic/diastolic had an improve outcome in patients with hypertension stage I, and stage II (Table 10). Patients had more adherent on medication and food knowledge due to MTM service by pharmacist home health care**.**

Table 10: Comparative of hypertension state change after medication therapy management by pharmacists

Stage	N = 253[a] (%)	1st average SBP/DBP (mmHg)	3rd average SBP/DBP (mmHg)	P Value [b] SBP	P Value [b] DBP
Normal SBP <120 and DBP <80	35 (13.8)	111.3±6.9 / 67.8±7.5	124.6±15.0 / 72.6±9.8	<0.01	0.003
Pre-hypertension SBP 120-139 or DBP 80-89	95 (37.5)	130.5±6.4 / 75.2±8.2	130.3±12.1 / 72.9±9.2	0.893	0.033
Stage I SBP 140-159 or DBP 90-99	82 (32.4)	146.0±8.3 / 83.3±9.7	140.7±18.8 / 81.3±11.8	0.011	0.110
Stage II SBP ≥160 or DBP ≥100	41 (16.2)	172.3±15.5 / 88.9±11.0	151.9±21.7 / 80.7±12.3	<0.01	0.001

SBP = systolic blood pressure DBP =diastolic blood pressure
[a] Number of patients who were completed 3 visit and follow up, [b] dependent sample t-test

2.3. Problems

2.3.1. Clinical problems

This study found the clinical problems (Table 11) were the peripheral neuropathy (46.5 %), diabetic retinopathy (19.1%), diabetic foot ulcer (4.1%), and

polyurea (3.8%). The clinical symptoms occurred from the drug treatment that was hypoglycemia, edema / ankle edema, postural hypotension and cough. The results of clinical symptoms were the peripheral neuropathy was defined from foot screening by monofilament, were used to diagnosis sensory loss of feet.

Table 11: Clinical problems list

Clinical Problems	N (288)	Problems per patient (%)
Peripheral neuropathy	134	46.5
Uncontrolled hypertension	119	41.3
Diabetic retinopathy	55	19.1
Pitting edema	22	7.6
Dizziness	12	4.1
Diabetic foot ulcer	12	4.1
Polyurea	11	3.8
Hypoglycemia	11	3.8
Stress / depression	7	2.4
Muscle pain	7	2.4
Edema / ankle edema	6	2.0
Postural hypotension	4	1.4
Cough	4	1.4

2.3.2.Drug related problems

For detecting of drug-therapy problems (DRPs), pharmacist home health care used criteria of Drug Related Problems Assessment Guideline (DAG) which were modified the part of categories from Strand LM and Hepler and the decision making criteria for medication management were also modified from PCNE Classification for Drug related problems. It can be said that DRPs originated from 3 levels: prescription, patient and delivery. This study categorized the classification based on original cause. The taxonomy classification of drug related problems were identified to eight different domains and 38 sub-domains of type of drug related problems (Appendix II.1).

There were three main problems that were classified as drug problems, disease problems (clinical symptom), and life style problems. The drug problems were defined to drug related problems. A total of 771 drug related problems (median 2.67 per patient) were addressed by registered community pharmacist, major issue 738 compliances (95%).

Separately, only drug related issues (33 problems) from the first visiting were classified into seven categories: the numbers of problems in the first visit were adverse drug reaction (20), drug interaction (4), untreated indication (4), sub-therapeutic dosage (3), and improper drug selection (2). The problem issues changed in the third visiting since the problems were solved; furthermore the drug related problems were reduced of adverse drug reactions and compliance. Nevertheless the untreated indication problem did not change. See Appendix II.2.

Table 12: Type and number of drug-related problems

Type of Drug Related Problems	**Number of problems (N=263)**		
	1st visit (288)	**2nd visit (274)**	**3rd visit (263)**
1. Untreated indication	**4**	**8**	**15**
2. Improper drug selection	**2**	**1**	**2**
3. Sub-therapeutic dosage	**3**	**2**	**0**
4. Over-dosage	**0**	**0**	**1**
5. Adverse drug reaction	**21**	**14**	**8**
6. Drug interaction	**5**	**4**	**0**
7. Invalid indication	**1**	**0**	**0**
8. Non-compliance	**822**	**885**	**684**
Total	**858**	**914**	**710**
Number of DRPs per patient	**2.98**	**3.33**	**2.69**

The non-adherence patient or non-compliance caused the highest incidence of drug related problems. The data showed that 92% of patients were found non-adherence with at least one medication. The patients intervened by registered community pharmacist at home; consequently, improved the adherence medication by 8% and 12% in the first to second and the second to the third visit, respectively.

The sub-group of drug related problems and number of drugs in three visits were classified in Table 13. The results showed a close relationship between the problems and the number of medication taken by patients. The problems became worse when the number of drugs increased. The study detected a higher number of untreated diseases in the second and the third visits. However, the problem could not be solved because of two reasons; the information was not forwarded to the doctors or the doctors took no action on the given information. Another two interesting issues are adverse drug reaction and drug interaction problems. The study found that these two problems could be reduced by the team in the second and third visit. As more information can be found in Appendix II.2.

Table 13: Drug related problems in sub-categories and number of drugs

	Number of Drugs	**N (263)**	**Untreated indication**	**Improper drug selection**	**Sub therapeutic dosage**	**Over dosage**	**Adverse drug reaction**	**Drug interaction**	**Invalid indication**	**Compliance**
1st Visit	1 – 3	28	2	1	0	0	2	0	0	42
	4 – 6	92	1	0	2	0	7	0	0	195
	7 - 9	85	1	1	1	0	5	2	0	298
	10 - 12	45	0	0	0	0	4	0	0	141
	> 12	13	0	0	0	0	2	2	0	62
	Total		**4**	**2**	**3**	**0**	**20**	**4**	**0**	**738**
2nd Visit	1 - 3	26	0	0	0	0	0	0	0	38
	4 - 6	94	4	1	0	0	4	0	0	209
	7 - 9	92	2	0	0	0	3	2	0	360
	10 - 12	37	1	0	1	0	4	0	0	158
	> 12	14	0	0	1	0	3	2	0	82
	Total		**7**	**1**	**2**	**0**	**14**	**4**	**0**	**847**
3rd Visit	1 - 3	28	0	0	0	0	0	0	0	33
	4 - 6	98	6	2	0	1	4	0	0	215
	7 - 9	83	8	0	0	0	3	0	0	250
	10 - 12	41	1	0	0	0	0	0	0	123
	> 12	13	0	0	0	0	1	0	0	63
	Total		**15**	**2**	**0**	**1**	**8**	**0**	**0**	**684**

Table 14: Drug related problems description, and recommendations by pharmacists

Modified Drug Related Problems (DRPs) Classification	**Example / Description**	**Recommendations**
1. Untreated indication: Recommendation to start a medication for a medical condition that is currently untreated but considered a standard of care	- Patients with untreated indication for prescription therapy (e.g., a patient with diabetes, hypertension, and Dyslipidemia) - Statin for patients with hypertentsion and total cholesterol above goal - Angiotensin-coverting enzyme inhibitor for patient with diabetes and micro-albuminuria	- Recommend as the guideline treatment - Physician consultation - Referral documentation to physicians
2. Improper drug selection:	- Patients continued Prednisolone tab prescribed for long time - An order to initiate drug therapy that was not indicated (e.g., patient continue on proton-pump inhibitor therapy after resolution of an acute gastrointestinal - The prescribing of multiple medications for the same disease state by multiple providers - Un-coordinate care may result in insufficient monitoring of a patient's disease states.	- Medication Adjustment as prescription - Stop taking medicine - Physician consultation - Referral to physicians' documentation
3. Sub-therapeutic dosage: Recommendation for alternative dosing for someone on a sub-therapeutic dose	- Patients had been demonstrated underuse of a drug product and the result was still noncompliant - Too low Aspirin dosage, 60 mg, for prevention cardiovascular disease -	- Dose increase suggestion - Dose schedule change suggestion - Referral documentation to physicians or healthcare providers
4. Over-dosage: Recommendation for alternative dosing for identification of a patient prescribes a dose that is inappropriately high or should ideally be titrated downward	- Patient had duplicate therapy from primary care and hospitals - Drugs	- Dose decrease suggestion - Dose schedule change suggestion - Referral documentation to physicians or healthcare providers

Table 15: Drug related problems description, and recommendations by pharmacists (Conti.)

Modified Drug Related Problems (DRPs) Classification *	**Example / Description**	**Recommendations**
5. Adverse drug reaction: Identification of a potential or actual adverse drug reaction	- Medications had adverse drug reactions (e.g., Glipizide, Glibenclamide, Metflomin, Furosemide, Copidogrel, Enalapril ect.)	- Dose increase suggestion - Dose decrease suggestion - Dose schedule change suggestion - Monitor for adverse drug reaction - Clarify drug dose or regimen
6. Drug interaction: Identification of clinically relevant drug interactions or warning of potential drug interactions	- Drugs were used to identify drug interaction (e.g., Simvastatin – Gemfibrozil (rhabdomyosis), Glibenclamide-Moxifloxacin)	- Referral documentation to physicians or healthcare providers - Stop taking medicine - Physician consultation -
7. Invalid indication: Recommendation to discontinue a medication that appears to lack an indication	- Patients had taken the drug "Brown mixture 3 times a day" that did not have an indication - Herbal or traditional medicine substitution	- Non-drug treatment suggested - Stop taking wrong medicine /or herbal
8. Compliance: Evidence that the patient is not taking the medication as prescribed - Not taking the medicine as directed by the prescription - Forgot to take the medication as directed by the prescription - Stop taking medicine without the doctor's permission - Lack of medicine - Not meeting with the doctor as appointed - Excessive use of medication ; herbal, health supplement - Impropriated medicine storage	- Drug was not being taken as prescribed due to several reasons or belief in drug dangerous - Drug was not taken / administration at all because the drug administrations' complication - Wrong drug taken / administration were complexity, numbers of drugs more than two items. - Patient was confused about drug regimen - Patient would prefer a different drug such as believe, friends influence, environment issues. - Lifestyle issues - Patient had not well experienced clinical problems - Store drug in the refrigerator	- Recommend to take drug as prescribed - Adherence aid suggested - Suggest adherence monitoring - Provide information or information provided - Non-drug treatment suggested - Suggest a proper way to store

2.3.3.Life style problems

The life- style problems were for example, having sweet fruits; having too much Thai dessert and lack of exercise.

These are main influences on their treatments. This means that without changing patient's behavior, their condition cannot be treated well. Since it is hard to change their life-style, it is then difficult to reach their goals.

2.4.Problem solving result

The numbers of referral cases were 34 patients (11.8 %) of total 288 patients. The response rate of refers were 55% physician accepted. The referral documents were brought to physicians by patients. Nevertheless, some of patients were not passed the information or referral documentation to physicians.

Table 16: Referral cases and response rate

Drug related problems	Refer cases (N)	Respond rate (%)
1. Untreated indication	4	2
2. Improper drug selection	2	-
3. Sub-therapeutic dosage	2	1
4. Over-dosage	1	1
5. Adverse drug reaction	12	8
6. Drug interaction	3	2
7. Invalid indication	1	-
8. Non-compliance	9	5
Total	**34**	**19 (55%)**

3.Humanistic outcome

3.1. Patient satisfactions

There were 25 items in patients satisfaction questionnaire were scored on a 5-point Likert scale, see Appendix VIII. The questionnaire asked about service

satisfaction with pharmacist home health care (i.e., How satisfied are you with the clarification of answers given by the pharmacist?)

The results of satisfaction level of Medication Therapy Management by pharmacist home health care were in the high level of satisfaction (83.3% (9.074 SD)), and have internal consistency in Cronbach's alpha 0.838 for total scale. The reliability test showed on Appendix IV.

Table 17: Satisfaction of pharmacist home health care services

Satisfaction	(25 questions)	
Satisfaction of service	Mean	3.332
(125 total scores)	SD	0.478
	Cronbach's Alpha	0.838

3.2. Diabetes Patient Quality of Life

3.2.1. The Diabetes Quality of Life (DQOL) questionnaire, see Appendix III, was developed by Diabetes Control and Complication Trial (DCCT). The questionnaires of DQOL were diabetes specific measurement of health related quality of life for use with adults. (The DCCT research Group., 1988). The instrument has been shown to have internal consistency in Cronbach's alpha 0.92 for total scale, for subscale: satisfaction with diabetes treatment (r= 0.88-0.86), impact of treatment diabetes(r= 0.77-0.85), and worry about the future effect of diabetes satisfaction (r= 0.66-0.67) (The DCCT Research Group, 1988).

The study was modified from the diabetes quality of life questionnaire of DQOL of Diabetes Control and Complication Trial (DCCT). These were self-administered questionnaires in three subscales; *1)* satisfaction with diabetes treatment, *2)* impact of treatment diabetes, and *3)* worry about the future effect of diabetes of 33 items (Debavalya U., 2008). The Items were scored on a 5-point Likert scale and are of two general formats. One format asks about the frequency of negative impact of diabetes itself or of the diabetes treatment (i.e., "How often do you worry about whether you

will pass out?) and provides respond option 1 (very satisfied) to 5 (all the time). The second format asks about satisfaction with treatment and quality of life (i.e., How satisfied are you with your current diabetes treatments?) and is scored from 1 (very satisfied) to 5 (very dissatisfied). Higher scores on DQOL items and subscales are, therefore, negatively valenced, indicating problems frequency or dissatisfaction.

The modified diabetes quality of life questionnaires of 33 items were tested of validity by Cronbach's Alpha. The result showed good total internal consistency (r= 0.780). The strong correlation with previous study in each of subscales *1)* satisfaction with diabetes treatment (r= 0.870), *2)* impact of treatment diabetes (r= 0.877), and *3)* worry about the future effect of diabetes (r= 0.933). The reliability test showed on Appendix IV.

Table 18: The Satisfaction of Diabetes Quality of Life (DQOL)

Modified Diabetes Quality of Life (DQOL)	**Number of items**	**Mean**	**SD**	**Cronbach's Alpha *(r)***
Dimension1: Satisfaction in life and activity daily	19	4.485	0.537	0.870
Dimension2: Satisfaction in diabetes disease impact	6	3.875	1.028	0.877
Dimension3: Satisfaction in worries about diabetes	8	4.019	1.122	0.933
Total	**33**	**4.201**	**0.872**	**0.780**

4.Economic Outcome

4.1. Economic outcome measurement

The study showed that 133 patients had received more medications than necessary. After calculated the information using a formula written in Appendix III, the cost of excessive drug given was 1,358.10 Baht per patients per month. As a result, the government, who are responsible to the expense, might be able to save about 16,297.72 Baht per patient per year.

Table 19: The cost and number of excessive drug per patient

	Number of excessive drugs (N=154)	**The cost of excessive drug (Baht) (N=125*)**
	Tablet / Month	**Baht /Month**
Mean (SD)	92 (91.09)	**1,358.10** (4,126.13)
Max	630	35,383.63
Min	1	0.72

* The number of patients who were receiving drug less than 2 weeks was excluded.

The figure in Table 20 showed that patients who had financial support as being government officers or relatives seemed to have quite high average cost of excessive drug per patient. This group of patients received better quality medications and higher price than others, except in self payment, due to the government support. As a result, the cost of each excessive drug among these patients was much higher than other patients with other kinds of support, such as Universal health coverage and Social security care.

Table 20: The average cost of excessive drug by health insurance care card

Health insurance care card	**(N=133)**	**The average cost of excessive drug per patient per month * (Baht)**
Government officer	34	2,124.69
Self payment	10	6,177.09
Universal health coverage	77	385.22
Social security care	4	221.27
Others	8	3.610.93

* Calculated from actual drug list from prescribers only, expired drug were excluded.

The figure in Table 21 showed that the estimate cost of excessive drug from the prevalence of uncontrolled diabetes in Bangkok was 497,295,254 Baht per month. The excessive drug cost expenditure should be concerned about health service for drug cost controlled. Furthermore, the pharmacist home health care service should be consideration for medication utilization of chronic patients.

Table 21: Estimate excessive drug cost as prevalence rate

	Prevalence rate [a] (2009)	**Population**
Thailand		64,000,000
Bangkok		**9,300,000**
DM prevalence in Thailand	6.9	4,416,000
DM prevalence in Bangkok	**9.2**	**855,600**
DM treatment but uncontrolled in Thailand	37	1,633,920
DM treatment but uncontrolled in Bangkok	**42.8**	**366,197**
	Estimate Excessive Drug Cost (Baht/Month)	
	Per patient [b]	**Per population (approximate calculation)**
Cost of excessive drug per patient in Thailand (Baht/Month)		2,218,863,360
Cost of excessive drug per patient in Bangkok (Baht/Month)	**1,358.00**	**497,295,254**

[a] data from Aekplakorn W. (2009). National Health Examination Survey Office (NHESO) (4th ed.). Bangkok.
[b] data from study

CHARTER V

DISCUSSION

This chapter covers discussion of the result or outcome of medication therapy management (MTM) service for diabetes care by pharmacist home health care and the elements of chronic care model (CCM) for diabetes discusses by this study. The chapter ends with the limitations of the study.

I. CHRONIC CARE MODEL WITH MEDICATION THERAPY MANAGEMENT (MTM) BY PHARMACIST HOME HEALH CARE SERVICES

This study integrated concept of Chronic Care Model for diabetes by Medication Therapy Management by pharmacist home health care. This study was applied into every elements of chronic care model. The CCM divided into two levels; organization level, and practice level. Figure 5 below shows how the model is related to this study and some suggestions and discussions related to the model.

I.1 Organization Level

1. **Health System**

   Health care organization

   The Financial incentives supported from National Health Security Office (NHSO) was important for sustainable of home health care services. This study cannot be pursued in the future if without the financial help from NHSO. In other words, without financial support, the practice cannot be conducted.

   Furthermore, the reimbursement pharmacist home health care service of a provider organization has a major impact on chronic care improvements especially; medication utilization, which are more likely to survive throughout

the long term if they increase revenues or reduce expenses. The chronic care quality, improvements are indicating to all health expenditures.

The health organization's goals and leaders do not view home health care by pharmacist as a priority in home health care team, innovation will not take place. The pharmacist home health care service should be a main job or routine activities in different level of care.

The Community Pharmacy Association (CPA) has members who practice in community pharmacy. The CPA should be strengthening the new role of community pharmacist for chronic patients in community area. The organization should be linkage with other health provider; secondary, tertiary hospital with pharmacy, and focus on continuity of care in pharmacy.

2. Community Resources and Policies

The health care provider, organizations need linkage with community-based resources for improve the chronic diseases; diabetes. The community linkages by the pharmacist home health care team provide care management due to helpful for the public health centers or primary care units with limited resources.

The village health volunteers in communities are important resource for intermediate supportive the patients and communicate the health information to each community. The health policy should motivate and encourage village health volunteers and build up to every community in Bangkok metropolitan.

The pharmacist home health care encourages patients to participate in effective home care community program. The following should be done:
The policy should establish a set of policies for the home health care visiting team. The care manager or case manager can be physician, nurse, pharmacist, and community pharmacist in pharmacy that depend on patients to closure consultation with provider. The chronic illness care policies propose home

health care service as requirement and can help indicating which patients should be visited.

The pharmacist home health care coordinates with nurse home care team. Nurse home health care is the important health provider to manage each case because they are responsible to all related health problems of the patient in communities.

Community Pharmacy Association (CPA) organized and supported the home health care program. The CPA helps to advertisement thought the member for expand the pharmacist home health care service activities.

I.2 Practice Level

1. Self-management support

Patients and caregivers must be properly educated and counseled and their medication therapy properly managed. These are what the team had done:
The pharmacist home health care is emphasis on patient empowerment and acquisition of self-management skill. This is to help patients' compliance and getting outcome improvements.

A personal medication record handbook for patient is focus on the personnel patient's medications. This book endorses the concept of health self management support and method of health information between patient and health provider; such as physicians, nurse, and pharmacists. The education program for family/ or care giver that this is to improve supports from the family and care givers.

2. Delivery system design

The delivery system design was built on the basis of MTM service through home visiting. This is particularly for patients who are at high risk as a result of chronic medical conditions and /or complex medication regimens. MTM

services that implement effective pharmacist home service greatly enhance patient care, leading to improved overall health, while at the same time decreasing overall health care system costs by reducing improper medication use, preventing adverse drug events and other undesirable outcomes and support achievement of the therapeutic goals.

The following is the practical design according to MTM services to help create pattern for each visiting. Community pharmacist home health care by 3 times of medication therapy management services. The role of the community pharmacist in primary health care team explores in pharmacist home health care in each catchment area. Furthermore, the patient registered with community pharmacy in each area should be considered.

The number of visiting can adjust by the clinical problems solving, drug related problems solving results, and severity of diseases. The pharmacist home health care planning can visit in every month, and every week; nevertheless, is not more than three months for cycle of home health care.

The long-term care is deemed necessary; many different reasons may hinder its implementation, especially in the home setting. In our study, these were mainly related to organizational problems, such as delays in performing the multidimensional assessment, the existence of waiting lists for residential services and delays in the provision of home. The home support is one of the core care services required in the community to enable elderly adults to remain at home. The pharmacist home health care from community pharmacy is a new home support delivery and performance management model. The linkage level of health providers should have the referral system. The referral system is lack of linkage between tertiary, secondary, and primary care, especially clinical profile for monitor. The longitudinal delivery continuity of care is associated with higher delivery of home health care services, improved diabetes control, lower health care cost.

3. Decision support

These are decision supports needed in the study. They are used to help encouraging the visit team consulting, helping and making decision better.

3.1 The specialist expertise team set up for pharmacist home health care. The visiting team should be able to contact and ask for help from this team when needed. The clinical decision support need more practice by case-based learning.

3.2 Evidence based guideline should set up by the professional health organization.

3.3 Home health care training program; this program provide for standardization and competency of community pharmacist home health care.

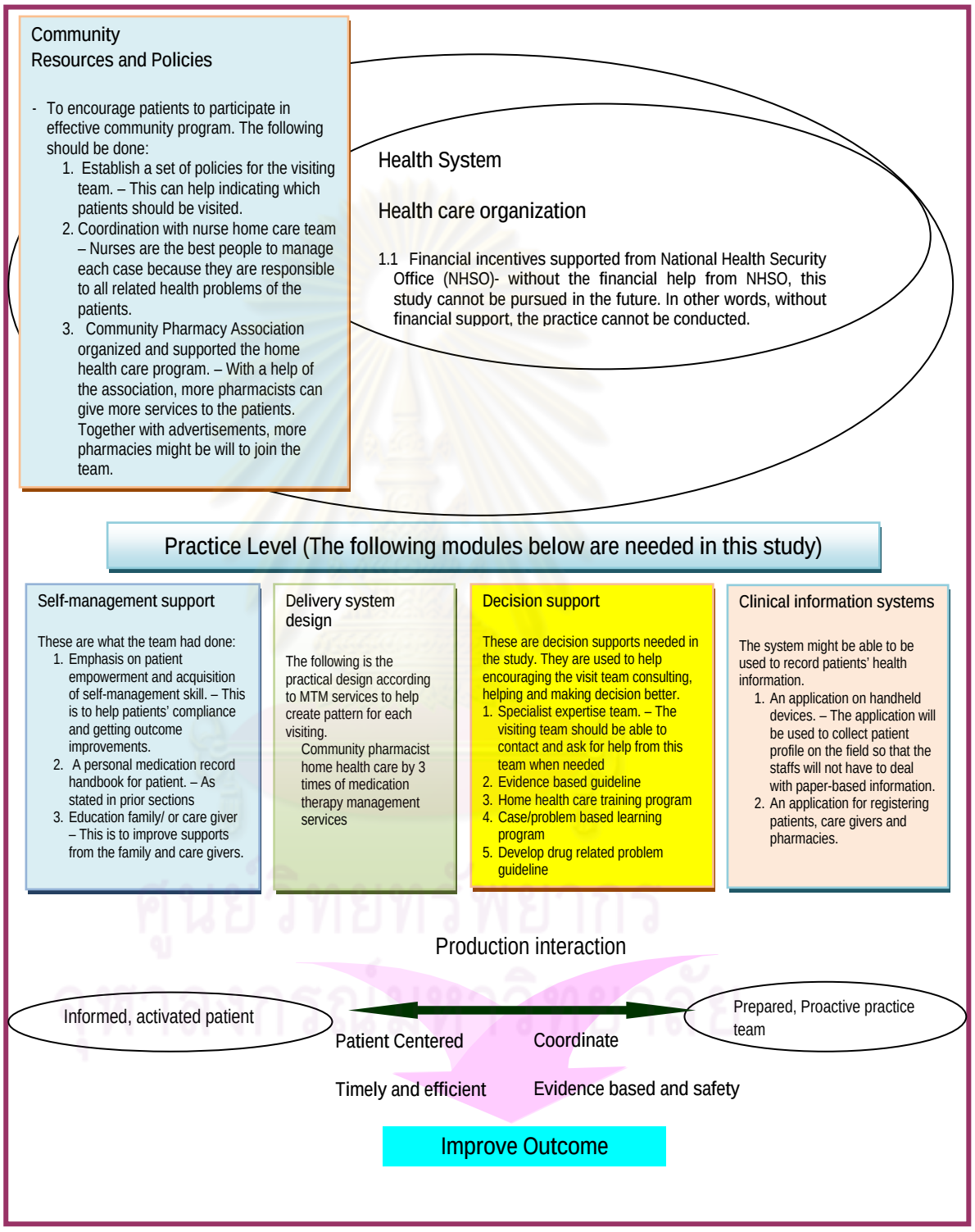
3.4 Case or problem based learning program; the pharmacist home health care can integrate knowledge for support tam.

3.5 The drug related problem guideline is for useful for define the problems.

4 Clinical information systems

The system might be able to be used to record patients' health information. An application on handheld devices cans application. The device will be used to collect patient profile on the field so that the staffs will not have to deal with paper-based information and the directly refer to physician. The patients, care givers can register with community pharmacies.

Figure 5: Chronic Care Model with Medication Therapy Management (MTM) by pharmacist home health care service



II. HOME HEALTH CARE PROCEDURE AND TOOLS BY MEDICATION THERAPY MANAGEMENT SERVICES

This study is mainly about diabetes which is a kind of chronic diseases. To deal with chronic illnesses, Chronic Care Model becomes a vital concept in practice. It is very important to choose a suitable tool to have the study done properly. Although Disease Management had been introduced for health service before MTM services, the disease management provide by other health professionals such as physicians, nurses, pharmacists, therapists, that did not seem to specifically services by pharmacists (Melissa et al., 2007). MTM service was then chosen instead for focus on pharmacist medication service management.

There are many other reasons of why MTM was selected. Firstly, the procedures are clear and can be easily followed. In addition, it was implemented worldwide and has been developed by many institutions in order to improve treatments as previous study (Barnett, M.J. et al.,2009). Furthermore, MTM could be used to serve patient individual needs. It also constructs an interaction between patients and the pharmacist, which is an individual approach as the patient-center care. This then builds good relationship and trust among them. Lastly, the procedures helped pharmacists treating patients more efficient continuity of care and medications management.

MTM focuses on medication management which is highly suitable for this study because the patients in the study had uncontrolled diabetes diseases. These patients need specific management on their drugs since these patients generally take several medicine; polypharmacy. It processes are also very helpful to this study.

Medication Therapy Review is the most important part because pharmacists will have to hold full responsibility to patients' medication by face-to-face interaction. This also builds a good relationship between the patient and the pharmacist. Building the relationship, the patient might be willing to give out information needed to the pharmacist. This then helps improving patient conditions.

After gaining useful information from the patient, the pharmacist and patient will then help each other improving adherence by implementing patient-centered approach. Discussing what the patient wants could help increasing adherence because

each person has their own issues. Understanding the issues will help adjusting medications for the patient. The result from this study also supported these assumptions.

However, some referral problems; overdose, drug interaction, have been solved by the pharmacists while others; untreated indication, adverse drug reaction, have remained. Although the pharmacists had found the problems, they could not help reliving them because these problems need to be transferred to the physician. The responses of referral depend on the hospital level such as the tertiary care has higher respond than private primary care unit. Without good inter-corporation between the pharmacists, the patients and the physicians, these issues cannot be put away. The pharmacist home health care could work with multidisciplinary team for data support and linkage by system.

The last issue on MTM is about the documentation. The documentation is another key component in MTM to help create consistency by creating and sharing professional documentation and information among members in the health care team. At the end of the study, documentation was established. The documentation can be used in almost all pharmacists setting. Nevertheless, this is not the best solution. Implementing an online-based system can be much more practical though the system needs training.

In order to complete the MTM service, the team staffs need to be standardized. In other words, these people need to be trained to be able to do their work towards the same direction following the same standard and procedures. Although there was a training team which helps training the staffs using a case-based learning, it was not efficient enough. This was because some of them had competent knowledge to do the work while some had not. To be able to take care of patients closely, hospital-based knowledge seemed to be insufficient. As a result, having modules related to pharmacist home health care in the university might be able to help pharmacists on taking care of patients. The modules must also concentrate on practicing pharmaceutical cares in communities, understanding public health, patient environment, finance and behavior.

Being trained, the pharmacists then had to visit patients at home. The team had decided of what tool were to be used in each visit. After the first visit, some tools were then adjusted to help patients such as plastic pill bags and labelers. The labelers were made bigger so that the patient could easily read them. For some patients, symbols and colors were needed to be used to help the patients understanding their medications better. These symbols and colors had been marked in their patient record book to help the patients or caregivers understand them. The size of plastic pill bag should the larger for the medication administration detail care fill up on the label. The suitable label medication could develop concept for elderly.

Another important tool used was Patient Record Book, which was a small booklet. It contains patient health information, diseases and conditions. At first, it was the pharmacists' responsibility to record blood pressure and other health information. Then, the pharmacists had to persuade patients to realize how the book might help them maintain their good health. The pharmacists encouraged that the book should be taken with the patient every time they come to meet with the physicians so that the physician can help recording other useful health information.

Inside the book, there was a page in the middle which is used to record patients' medications. The reason of why the page is in the middle is that patients can easily take out the page and stick it where they might prefer. An example of the book can be seen in the Appendix I.

There was also Knowledge Guideline for Community Pharmacists. It consists of knowledge about diabetes, blood pressure, medications, food, and the importance of adherence. Without the guideline, some patients could not understand what pharmacists were talking about. Seeing pictures could help them following the pharmacists. Although, it was sufficient to be used in this study, to be applied in practice, the guideline needs to be improved in an area of other diseases such as kidney disease, asthma, cerebro-vascular disease and more details about food.

Prior sections were mostly about tools and staffs. The following sections are going to be mainly about procedures done by the team.

Most of patient information used in this study came from Bangkok Public Health Centers. This is because the study concentrated on patients in the communities and the center had already a visiting nurse home health team which knew about the communities and the patients. Cooperating with them helped the study team work easier, safer and quicker. The center had registered volunteers health village in each community. These volunteers were very helpful to the study team because they were from the visiting communities. Therefore, there are more advantages of working together with the center than asking for cooperation from public hospitals.

After gaining sufficient useful information, the team started to visit the patients. During the first visits, trusts and relationship were not built therefore patients did not give out all health information, such as not telling or showing all medications they had got, to the team. The team was struggling a little bit about having insufficient information in the first visit.

The second visit was brought up to monitor how well the patients had complied the suggestions. The period of time between the first and the second visit was two to four weeks. The reason of why it is the appropriate time gap is that some problems need some time to be improved. For severe diabetics and adverse drug related problems, two weeks seems to be the best time gap because they might still need some help from the pharmacists while other general patients might be able to follow the suggestions without further problems. The latter group can then be left for up to four weeks before the second visit.

In this visit, the pharmacists gained more trust and built better relationship. As a result, the team could identify problems and ideal solutions for the patients. The team was then able to refer the patients to the hospitals where they received proper treatments. Thus, the patients were continuously taken off by professionals. In contrast, some patient refused the second follow-up. Some patients misunderstood suggestions from the pharmacists or some caregivers did not allow the team to visit the patients for the second time. For these patients, only solution seems to be setting on-line based medical care system so that the physicians can retrieve the information. After the physician has taken actions, the patients might be willing to participate to

the program. Furthermore, in the first two visits, some patients might not realize any improvement; therefore the third visit should be done.

The third visits were mainly about checking the adherence and monitoring their problems whether they have been solved. If the team finds any unsolved problem, the pharmacists need to contact other home health care to ensure that they are solved. At first, it was predicted that only three visits should have been enough. After completing the study, the study showed that three visits were not enough because of many reasons.

Firstly, many patients had a lot of co-morbidities which cannot be solved within just three weeks. That is because these patients consumed a lot of medications and the medications were always changed from time to time. In addition, working only with pharmacists was not efficient. There should have been more professionals, such as nurses and physicians, within the team to help on other perspectives.

Lastly, diabetics normally meet up with the physicians every three months. Patients' medications might be changed. This means that if the patients did not meet up with the physician during the period of study time, it is possible that the team might not be able to help the patients on their new medications. As a consequence, each patient should gain a visit every a quarter which means every three months. However, the frequency might be adjusted according to patients' conditions and diseases. For some cases, visiting every month is probably best suitable. In some patients, especially those who have cerebro-vascular disease, corporation between pharmacists and nurses could be helpful. It is because the nurses have to visit the patients so the nurses can check their medical information and inform the pharmacists after their visit. If the patients need any helps, the pharmacists then visit them.

In Taiwan, the pharmacist home health care visits 8 times per patient per year that can reimburse in 1,000 Bath per times from the National Health Security Officer. The name lists of patients send to community pharmacist that is selected from high medication expenditure and hospitalization. There data health information is all linkage in every level of health care setting.

The numbers of pharmacist home health care for diabetes depend on the complication and severity of diseases, and problems from polypharmacy. The MTM can service in community pharmacy that has less frequency numbers of home care visiting by linkage systems from hospital to community pharmacy.

Concerning the visiting time, it took longest in the first visit since the team needed to acquire a lot of patients' health information. The information contained demographic data, health status, patient medications, and patient life-style information. It is really important to gain this information to help solving their clinical problems because these people cannot control the disease well. It took about 25 minutes to complete this process. After that the pharmacists counted pills for another 10 minutes to decide whether the patients had taken their medications as prescribed. It is then followed by 15 minutes of discussions and education about food, treatments and medications to help the patients improving and solving their problems. The first visit takes approximately 45 to 60 minutes depending on patients.

The second and the third visit take shorter time than the first visit because there is no need of asking for patients' information. As a result, the remaining processes are making pill counts, checking compliance, and asking about problems; either old or new. These take about 30 minutes.

According to the second and the third visit, the first visit might be able to take shorter than 45 minutes if there exists patients' information; for example lab test result, patient health status and medication lists. Having a complete referral system, among hospital, primary care units and home the health care team, seems to be helpful to reduce time taken in each visit. Allowing community pharmacies to take actions on this process is another solution. This means asking patients to take their medications to the community pharmacies when they have any problems or when they need helps so the team does not have to visit all diabetics in their places.

III. THE MEDICATION THERAPY MANAGEMENT SERVICE OUTCOMES BY PHARMACIST HOME HEALH CARE

There are two main outcome issues shown by this study; intermediate and clinical outcome.

2.1.The intermediate outcome

The intermediate outcome shows an improvement of problems caused by non-compliance patients. According to the study, problems that had been solved by the health care services are not taking the medication as prescribed, not meeting with physicians as appointed, excessive medication usage, and inappropriate medicine storage. This is because of useful information given by the pharmacists which helped encouraging patients to follow physicians' instructions. As a result, continuing these services might be able to help even more patients.

In contrast, some problems that related to patients' behaviors, such as forgetting to take the medication as prescribed, stop taking medicine without physicians' permission, and lack of medications, could not be recovered by the health care services. The reasons of why these have no improvement might be because diabetics are lack of disease and medication awareness and education. The patients seemed to not take care of themselves nor take medications as directed by physicians since diabetes is a kind of disease which does not show the symptoms until it is in a severe condition. Consequently, giving knowledge and encouraging awareness might be the best solutions for the problems.

Concerning on age of the patients, the study exhibits in Table 5 that most elderly have low adherence level. There are many reasons for the result. It is probably because, for example, they cannot read labels clearly, they do not understand labels, medication directions are written complicatedly, or they misunderstand that the medication may harm their health so they decided to stop taking some medication and might turn themselves to herbal medications instead.

In addition, Non-adherent patients are also likely to have a close relationship with the number of drugs taken. That means the bigger the number of drugs, the

smaller the adherence level. Furthermore, the higher the patients' age also leads to the greater the number of diseases and the number of drugs that they have to take, respectively. As a result, all causes given in the previous sections can also be stated in this section since the elderly tend to not aware of proper treatments.

To emphasize, the number of diseases found in each diabetes patient also brought down the adherence level. This is, for a second time, because patients who have many diseases need a larger number of drugs than those who have few. As a result, having pharmacists to take care of these patients from the first place will probably be able to help stopping the growth of the number of diseases in patients and therefore the patients do not have to take so many medications.

Referring to the information from the study, it may be able to claim that MTM service at home could help improving adherence level as the study showed that non-adherent patients in the second and the third visit are lower than prior visit. However, there are some non-adherent patients left in the third visit. That is because the study period was too short to help changing some patients to reach their medical goals.

2.2. The clinical outcomes

The clinical outcome shows in the results of fasting plasma glucose level will be discussed in the first few sections and the second in results of blood pressure level in hypertension stage will discuss.

There were a bit changes. That is because there was a difficulty to retrieve laboratory result from the hospital since the patients hesitated to ask for the information from their physicians. As a result, the fasting plasma glucose data were received from Bangkok public health centers which only available data, did not from hospitals. The data of fasting plasma glucose level had only 77 patients. In additional, the glycated hemoglobin (HbA1c) could not be collected due to there were not in routine check up for everyone in period of study and community based data was limited. These were limitation of data system or data connection for diabetes care program in Bangkok and the patients were not aware or receive of individual health data from health care providers.

One of the most important reasons of why this cannot be controlled is that this type of disease is a kind of chronic disease. Therefore, it needs more time than just six months. As the fact that chronic diseases need continue treatments, patients should work closely with multi-disciplinary health care team in order to control their condition better. The pharmacist home health care team will then be able to forward any problems about patients' diseases, medications and conditions found to the hospitals or the physicians e(Bruce, 2010).

Another reason is that the study team did not receive patients' laboratory results which can be used as an evidence support so the pharmacist home health care team can service by continuity of care for the patients and suggest what might be important to their diseases and conditions.

As a result, there should be a referral system for registered chronic patients. This system should hold information such as fasting plasma glucose level, HbA1C, basic laboratory or data profile so that the pharmacist home health care team could help assessments and monitoring whether the medication is appropriate to the patients. Then the home based data recorded by the pharmacist home health care team will also be transferred back to the referral system and to the physicians, nurse respectively. The clinical information's patients should be create in electronic referral system for health management.

Moreover, patients cannot understand or derive anything when they see their laboratory results so they do not aware of their conditions nor reach their health goals. Without the awareness, complication of diabetes such as peripheral neuropathy, diabetic foot ulcer, and diabetic retinopathy, will be brought up. These diseases influence patients' quality of lives greatly. Therefore, having individual of a patient record book /or health booklet might help improving the awareness. These booklets should consist of patients' information, such as diseases, treatments and hospitals, medications' information and laboratory results. This information can be filled by themselves/or health care providers as physicians, nurse and pharmacist who take care of the patients. This means that the patients are responsible to bring their own booklet every time to see the physicians or health care team.

However, the visiting team needs to encourage them to look after the booklets and to understand their disease and conditions. In the end, the team might then gain some information they need to take care of the patients from the booklet. Not only the booklets may help, but also implementing a routine check-up system might be another good process to help patients avoid other serious concomitant diseases.

It will be useful to discuss about hypertension as hypertension and diabetes are always found together in a patient. As a result, every visit, the team measured patients' blood pressure. The study concentrated on patients with hypertension State II as JNC VII guideline since without good care, these patients might have cerebro-vascular diseases. That is because the patients, in State II, had not taken medicine as prescribed. After the pharmacists gave suggestions on life-styles and medications, these patients' conditions were then improved. The patients were improved by the visiting team due to the encouragement from the pharmacists in the visiting home health care team on taking medications appropriately. To continue the satisfactory results, the pharmacists' home health care team should persuade the patients to have their blood pressure measured by pharmacies nearby if they do not have a blood pressure monitor at home.

In the community pharmacies, patients should be educated on how to treat themselves to their diseases by community pharmacists. Furthermore, community pharmacists should keep patients' profile so that next visit, the patients can be treated, monitor, and follow up according to their conditions. The patients can access of pharmacist service in the community pharmacy. Another important reason of why doing this might help is that patients will not have to pay for any transportation since they can reach to the place easily.

IV. PROBLMES SOLVED BY PHARMACIST HOME HEALTH CARE

This study found that the two more co-morbidity were the main in diabetes Table 7 such as hypertension, dyslipidemia. The clinical problems, complications in Table 10 of diabetes patient, the results were peripheral neuropathy, diabetic

retinopathy, diabetic foot ulcer, hypoglycemia, and others. The similar results of prevalence were also found in the studies of the Endocrine Society of Thailand Diabetes register project 2003. The multiple medications or polypharmacy were used to treat in diabetes that increased the drug related problems. The drug related problems were increased a relationship numbers of drugs showed in Table 12 and the results of polypharmacy. The pharmacists home health care were solving the problem by medication monitor, report data refer to physician for check up, nurse for supporting. The health care teams were collaborated by referral report data for problem solving.

There were many drug related problems found at the beginning of the study such as adverse drug reaction, drug interaction and sub-therapeutic doses. The pharmacist team helped solving these problems so that the problems were reduced by informing these problems to physicians. Consequently, the physicians respond to the recommendations and the patients were then taken care of properly.

For the untreated indication problems, they were found more in the second and the third visit than in the first visit. The reasons of why the problems cannot be solved are that the physicians did not well respond to the problems and the pharmacists could not help solving the problems without the help of the physicians. Not only the prior problems were not solved, new problems were also found. This led to the higher number of problems. Another kind of problems which depends mostly on physicians is the improper drug selection problems. This type of problems will be solved if the pharmacists follow the same evident support and guidelines as what the physician's use. In other countries, physicians and pharmacists need to decide and agree a practice guideline together. The respondent tool was fill data in physician responded form or personnel medication record booklet for linkage with pharmacist home health care teams. The physician in tertiary care had the most response rate of problems solving; conversely, less response rate from primary care units.

From the study, each patient had more than one non-compliance problem. The problems ranged from improper drug storage, not taking drugs as directed by the prescription, forgetting to take the medication and stop taking medicine without the physician's permission. Not taking drugs as directed by the prescription means the

patients' adjusted dosage themselves for example taking only once or twice a day instead of thrice like what had been prescribed. According to the problems, the pharmacist home health care team should encourage the patients taking their medications as directed and instruct them about advantages of taking them as prescribed such as outcome improvement and complication reduction. In addition, the patients should be told about disadvantages when not following the instruction of the physicians. For the patients who could not remember to take their medicine, the pharmacists should figure out ways to help these patients by for example giving pill reminders and managing unit dose for one day and teaching caregivers to fill up the empty slots. This seems to be an effective way to improve adherence rates. In some cases, patients tend to stop taking their medications when they get confused of how to take or use them. The pharmacists are also responsible for teaching them to take their medicine or giving a guideline for the patients so that they can look up when having a drug related problem. These three problems can be solved by helps of the pharmacists because the patients can adjust their behaviors when they have right understandings.

Furthermore, the pharmacists could also help on excessive use of medications such as herbal and other traditional medicines. Some patients do not understand that these medications could not help curing the diseases. To get rid of patient improper beliefs, pharmacists need to continue giving correct advices and persuade the patients not to stop taking their medications. The last point is the improper medication storage. This can be solved by educating patients to keep medicine correctly such as keeping in a box, out of sun-light and heat, and not keeping them in the refrigerators.

On the other hand, lack of medicines and not meeting with the physicians as appointed could not be helped by the pharmacists. That is because they are based on many factors such as no one took them to the hospital, it was hard for them to get to hospital due to their conditions and finance. As a result, the pharmacists could not help with these problems. However, the government might be able to help by giving a better support such as a delivery service or allowing patients to register to their pharmacy catchment area for refill their medications easier.

V. COMMUNITY PHARMACIST IN HEALTH CARE SYSTEM

The home health care was necessary for long term care; especially, diabetes, cerebro-vascular disease, and kidney diseases or patients with polpharmacy. The community-based programs represent a low cost alternative to skill pharmacist home care because they either delay or avert altogether the decision to institutionalize an individual in need of long-term care for chronic diseases. The community pharmacies as the health care provider in primary level was distributed closing in community. The strength of community pharmacies are the unit of health that surveillance the communicated diseases and non-communicate diseases.

VI. LIMITATIONS

Three limitations of this study should be considered. First, the data in this study was collected by asking patients to reported variation in ways of obtaining data. It is possible that all patients' medicines in the home were not examined as patients could choose what medicine to show the pharmacist home health care team. Not recording the presence of risk factors related to these unseen medicines potentially underestimates the strength of the relationships between various medication-related risk factors. The study relied on the health professional participating in the study returned collected data as participants were located variable health setting such as primary care units, and hospitals. Secondly, these data reflect the no practice outcome data were available to assess the impact of the Medication Therapy Management (MTM) activities and resolving drug related problems (DRPs) in home health care on diabetes patient health outcomes. Future research on MTM might include patient outcome data and/or the use of an expert panel to evaluate change made in drug therapy. Finally, limitation is that the lack of control group may also have weakened and the costs and resources associated with pharmacist home health care service program were not evaluated.

CHAPTER VI

CONCLUSIONS AND RECOMMENDTIONS

This study found that the intervention by registered community pharmacists could resolve problems and improve medication adherence through the medication therapy management (MTM) service at home. The community pharmacist worked with patients' family members or caregivers, provider home care team and collaborative relationships with the physicians, this facilitates the MTM process to develop an accurate, comprehensive active medication profile. However, in a medical home, a community pharmacist could manage chronic medication therapies for the selected patients in a more cost-effective manner. They suggested use of quality reporting measures that would be linked to primary care unit development and be implemented to support quality of patient care and lead to more education, empowered patients. At the point of care, pharmacist could also evaluate regimens for potential drug interactions, allergies, dosage adjustments, adverse events, therapeutic duplication, cost-effective therapies, and adherence trends; furthermore, the improved other aspects of quality of care.

Home health care is an essential service that helps high risk patients that are unable to safely, adequately, and reliably manage their care plan because of physical or cognitive deficits may need a continued assistance of home health care. With increasing numbers of chronic disease in frail older people and the declining availability of formal providers and informal social support networks, urban home health care may be challenged to respond to increase demands for service and to sustain quality patient outcomes. In addition to improving patient safety, the medication intervention program could potentially have a positive impact cost-by increasing treatment costs resulting from adverse events e.g., from preventable strokes) and by decreasing drug costs (e.g., from harmful/duplicative drugs). Further study will be needed to determine the extent of the possible savings and identifying ways to further solve economic and clinical issues. According to a recent review, continuity of care has two elements: care of individual patient and care delivery

overtime as home health care services. In particular, management continuity of home health care delivery plays an important role especially in chronic disease as diabetes or complex clinical disease that requires management from several providers. For policy makers, these study results are the importance of providing the resources to create evidence-based, practical interventions for improving patient safety in medication by pharmacist home health care. Home health care were be mostly beneficial if it well planned and prepared as the chronic care model. This study concluded that community pharmacist home health care could alleviate patients' medication utilization problems and would thus improve overall quality of patient care. The integrated care among primary care units and community pharmacists would be recommended to extend to other provinces and at a larger scale. Furthermore, the continuity of diabetes care should be registered diabetes patients with community pharmacy by catchment area for medication monitoring and refill medication system consideration.

Policy Recommendation

The delivery of home health care medications to patients is a new and expanded opportunity for community pharmacists who are eager to practice pharmaceutical care. Based on the results of this study, it is suggested that health care providers and health policymakers integrated Medication Therapy Management (MTM) for improving quality of patient medication utilization in chronic conditions the particularly, provided by pharmacists, should be included in a part of benefit package for patients.

In Thailand, the community pharmacist in pharmacy is healthcare provider that patients can access medicines and health information in community that are in a unique position in the health care system which distribute in all communities. The community pharmacists as health care professional services in medicines management and adherence screening, a long term care and a growing role in health promotion for chronic diseases.

Recommendation for Future

The patients-registered system should be setting with community pharmacy for continuity of care for all patients and preventive care for their families. The community pharmacist is “family pharmacist concept” for family health management.

The data linkage between hospital and community pharmacy will create the program for data support in medication, laboratory for monitoring.

Integrating community pharmacy services as a part of health benefit scheme would improve patient medication utilization and in turn improve patient medication therapy.

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APPENDIX A

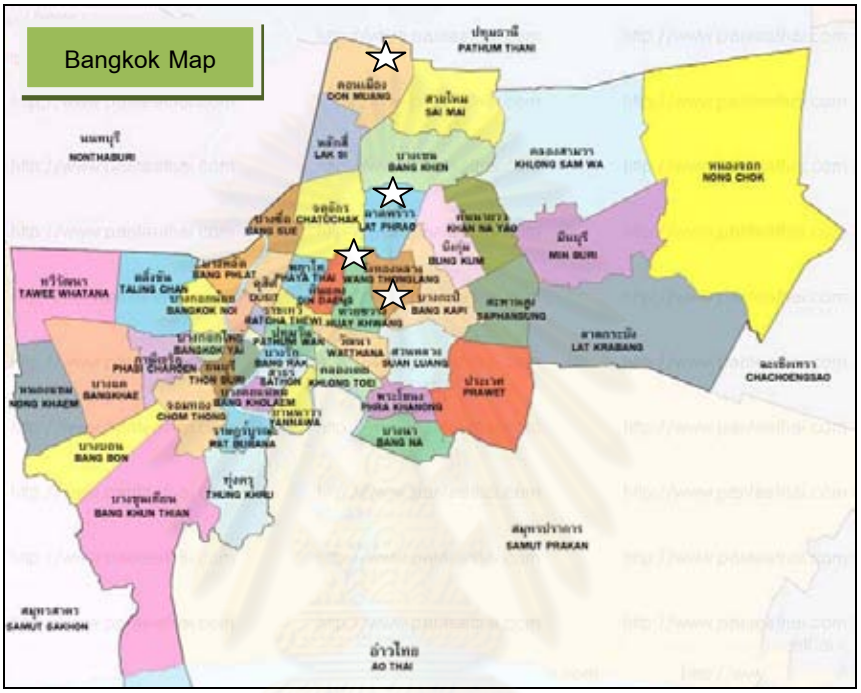
COMMUNITIES LISTS AND MAPPING AREA

APPENDIX I.1: List of community and Bangkok Public Health Centers

Table 22: List of community and Bangkok Public Health Centers
(ชุมชนที่เข้าร่วมโครงการและศูนย์บริการสาธารณสุข กทม.)

ชื่อชุมชน (แยกตามศูนย์บริการสาธารณสุข) 34 ชุมชน			
ศูนย์ 15 (ลาดพร้าว)	**ศูนย์ 25 (ห้วยขวาง)**	**ศูนย์ 60 (รสสุคนธ์ มโนชญกร)**	**ศูนย์ 66 (ตำหนักพระแม่กวนอิม)**
ซอยลาดพร้าว 80	ไทย - ญี่ปุ่น	ร่วมมิตรแรงศรัทธา	เนียมกล่ำ
ซอยลาดพร้าว 64 แยก 9	พระรามเก้าพัฒนา	ประชาอุทิศม่วงมณีร่วมใจ	แฟลตอาคารสงเคราะห์
ซอยพระยาประเสริฐ	ซอยร่มเย็น	โกสุมสามัคคี 1	ซอยลาดปลาเค้า 49
หมู่บ้านพลับพลา	ซอย ส.ธรณินทร์	โกสุมสามัคคี 2	ซอยลาดปลาเค้า 55
หมู่บ้านบดินทร์รักษา	หมู่บ้านสุนทรศิริ	หมู่บ้านปิ่นเจริญ 1	ซอยลาดปลาเค้า 61
		หมู่บ้านปิ่นเจริญ 2	ซอยโรงน้ำแข็ง
		หมู่บ้านวังทอง	ซอยนกแก้วน้อย
		หมู่บ้านเปรมประชา	ซอยพุ่มโพธิ์
		หมู่บ้านศิริสุข	ซอยโชคชัย 4 แยก 36
			หมู่บ้านลาดพร้าววิลเลจ
			หมู่บ้าน ต.รวมโชค
			หมู่บ้านสังสิทธิ์
			หมู่บ้านอยู่เจริญ
			หมู่บ้านโอษธิศ
			หมู่บ้านมหาลาภ
5 ชุมชน	**5 ชุมชน**	**9 ชุมชน**	**15 ชุมชน**

Figure 7: Communities Mapping of Bangkok Area



APPENDIX B

DRUG RELATED PROBLEMS

APPENDIX II.1 Drug Related Problems Assessment Guideline

Table 23: Drug related problems assessment guideline (DAG)

แนวทางการประเมินปัญหาการใช้ยาของผู้ป่วย (Drug Related Problems Assessment Guideline: DAG)

ประเภทปัญหาจากการใช้ยา	การจำแนกสาเหตุของปัญหา		การแก้ไขปัญหา
1. Untreated indication (การไม่ได้รับยาที่สมควรจะได้รับ)	1.1 การไม่ได้รักษาโรคหรืออาการที่นำผู้ป่วยมาพบแพทย์ (The patient is in need of drug therapy but is not receiving it.)		- CD + RD
	1.2 การไม่ได้รักษาโรคหรืออาการที่เกิดขึ้นใหม่ หลังจากที่รักษาไปแล้วระยะหนึ่ง (The new problem has not been identifies or treated.)		- CD + RD
	1.3 การหยุดยาที่ผู้ป่วยต้องใช้ในการควบคุม หรือ รักษาโรคหรืออาการที่เป็นขณะนั้น (The continuity of drug therapy has been interrupted.)		- CD + P (เพิ่มยาที่ผู้ป่วยควรได้รับ)
	1.4 ผู้ป่วยไม่ได้รับยาที่ควรใช้สำหรับป้องกันอาการหรือโรค (The patient is in need of prophylaxis or premedication.)		- CD + P (เพิ่มยาที่ผู้ป่วยควรได้รับ)
	1.5 การมียาที่ควรให้เพื่อเสริมฤทธิ์ในการรักษา (The patient needs a synergistic or potentiating drug therapy.)		- CD + P (เพิ่มยาที่ผู้ป่วยควรได้รับ)
2. Improper drug selection (การเลือกใช้ยาที่ไม่เหมาะสม)	2.1 การเลือกใช้ยาที่ไม่ประสิทธิภาพในการรักษาไม่เหมาะสมกับโรค (The drug therapy is ineffective.)		- CD + P (ปรับเปลี่ยนยาให้เหมาะสม)
	2.2 การเลือกใช้ยาที่เป็นข้อห้ามใช้ (Receive drug therapy that contraindications exist.)		- CD + P (หยุดยา)
	2.3 การเลือกใช้ยาที่ทำให้ผู้ป่วยเกิดการแพ้ยา (Receive a particular drug therapy in the presence of an allergy to that drug.)		- CD + P (ติดตามอาการแพ้ยา)
	2.4 การเลือกใช้ยาที่มีประสิทธิภาพ แต่เป็นยาที่ไม่ปลอดภัยสำหรับผู้ป่วยรายนั้น (There exists an equally effective, safer drug than that presently being used.)		- CD + P (หยุดยา)
	2.5 การเลือกใช้ยาที่มีประสิทธิภาพ แต่ไม่คุ้มค่าในทางเศรษฐกิจ (There is an equally effective but less expensive drug available.)		- CD + P (ปรับเปลี่ยนยาให้เหมาะสม)
	2.6 การใช้ยาหลายตัวร่วมกัน ในขณะที่การใช้ยาเพียงตัวเดียวให้ประสิทธิภาพเท่ากัน (The patient is receiving combination therapy when a single drug would be expected to be equally effective.)		- CD + P (ปรับเปลี่ยนยาให้เหมาะสม)
3. Sub-therapeutic dosage (การใช้ยาในขนาดต่ำกว่าการรักษา)	3.1 กำหนดขนาดยาในขนาดที่ต่ำเกินไป (The dose less than optimal.)		- CD + P (ปรับเปลี่ยนขนาดยา)
	3.2 รับประทานยาแต่ละมื้อห่างกันมากเกินไป (Receive inappropriate dosing interval.) (too long)		- CD + P (ปรับเปลี่ยนการรับประทาน)
	3.3 การเลือกใช้รูปแบบยาที่ไม่เหมาะสม ทำให้ผู้ป่วยได้รับยาน้อยเกินไป (Receive inappropriate dosage form.)		- CD + P (ปรับเปลี่ยนยาให้เหมาะสม)
	3.4 การเปลี่ยนแปลงสูตรตำรับยา หรือ เปลี่ยนยี่ห้อยา ซึ่งทำให้ได้รับยาน้อยกว่าเดิม (Conversions to difference formulation or brand.)		- CD + P (ปรับเปลี่ยนยาให้เหมาะสม)
	3.5 การใช้ยาเสื่อมสภาพ หรือ ยาที่หมดอายุ (Receive the expired or deteriorated drugs.)		- CD + P (หยุดยา)
	3.6 การเปลี่ยนวิธีการให้ยา แต่ไม่ได้ปรับขนาดการให้ยาให้ถูกต้อง (Conversions to difference route.)		- CD + P (ปรับเปลี่ยนยาให้เหมาะสม)
	3.7 การปรับลดขนาดยาเร็วเกินไป ทำให้ผู้ป่วยเกิดอาการถอนยา (A patient's dose is decreased rapidly.) (withdrawal)		- CD + RD

Table 24: Drug related problems assessment guideline (DAG) (Cont.)

ประเภทปัญหาจากการใช้ยา	การจำแนกสาเหตุของปัญหา	การแก้ไขปัญหา
4. Over-dosage (การใช้ยาในขนาดที่มากเกินไป)	4.1 การกำหนดยาในขนาดที่สูงเกินไป (The dose is too much.)	- CD + P (ปรับเปลี่ยนขนาดยา)
	4.2 ระยะเวลาในการบริหารยาแต่ละมื้อถี่เกินไป (Receiving inappropriate dosing interval.) (too frequency)	- CD + P (ปรับเปลี่ยนการรับประทาน)
	4.3 การเลือกใช้รูปแบบยาที่ไม่เหมาะสม ทำให้ผู้ป่วยได้รับยามากเกินไป (Receive inappropriate dosage form.)	- CD + P (ปรับเปลี่ยนยาให้เหมาะสม)
	4.4 การเปลี่ยนแปลงสูตรตำรับยา หรือ เปลี่ยนยี่ห้อยา ซึ่งทำให้ได้รับยามากกว่าเดิม (Conversions to difference formulation or brand.)	- CD + P (ปรับเปลี่ยนยาให้เหมาะสม)
	4.5 การเปลี่ยนวิธีการให้ยา แต่ไม่ได้ปรับขนาดการให้ยาให้ถูกต้อง (Conversions to difference route.)	- CD + P (ปรับเปลี่ยนยาให้เหมาะสม)
5. Adverse drug reaction (อาการไม่พึงประสงค์จากการใช้ยา)	5.1 การเกิดอาการข้างเคียงจากการใช้ยา (Side effects – Type A ADR)	- P (หยุดยา) + CD
	5.2 การแพ้ยา (Drug allergy – Type B ADR)	- P (หยุดยา) + CD
6. Drug interaction (การเกิดปฏิกิริยาระหว่างกันของยา)	6.1 การเกิดอันตรกิริยาระหว่างกันของยากับยา (Drug – drug interactions)	- P (แนะนำปรับเปลี่ยนให้เหมาะสม) + CD
	6.2 การเกิดอันตรกิริยาระหว่างกันของยากับอาหาร (Drug – food interactions)	- P (แนะนำปรับเปลี่ยนให้เหมาะสม) + CD
	6.3 การเกิดอันตรกิริยาระหว่างยากับโรค (Drug – disease interactions)	- P (แนะนำปรับเปลี่ยนให้เหมาะสม) + CD
6. Invalid indication (การใช้ยาที่โดยไม่มีข้อบ่งใช้ทางวิชาการ หรือไม่มีข้อมูลยืนยันถึงข้อบ่งใช้ทางวิชาการ)	6.1 การใช้ยาในทางที่ผิด (Drug abuse)	- P (แนะนำปรับเปลี่ยนให้เหมาะสม) + CD
	6.2 การติดยา (Drug dependence)	- P (แนะนำปรับเปลี่ยนให้เหมาะสม) + CD
	6.3 การใช้ยาโดยไม่มี โรคหรืออาการ ที่เป็นข้อบ่งใช้ของยา (Use the drug without indication)	- P (แนะนำปรับเปลี่ยนให้เหมาะสม) + CD
8. Non – compliance (ความไม่ร่วมมือในการใช้ยา)	8.1 การใช้ยาไม่ตรงตามแพทย์สั่ง	- P (Review medication + Counseling patient + Patient education)
	8.2 การลืมรับประทานยา	- P (Review medication + Counseling patient + Patient education)
	8.3 การหยุดยาเอง	- P (Review medication + Counseling patient + Patient education)
	8.4 การขาดยา (ยาหมดก่อนกำหนด เช่น ทำยาหาย, ให้ยาผู้อื่น)	- P (Review medication + Counseling patient + Patient education)
	8.5 การไม่ไปพบแพทย์ตามนัดหมาย	- P (Review medication + Counseling patient + Patient education)
	8.6 การใช้ยาเกินความจำเป็น รวมถึงการซื้อยาใช้เอง (ทำให้เกิดความเสี่ยง/ปัญหาจากการใช้ยา)	- P (Review medication + Counseling patient + Patient education)
	8.7 การเก็บรักษายาไม่ถูกต้อง (ทำให้เกิดความเสี่ยง/ปัญหาการใช้ยา)	- P (Review medication + Counseling patient + Patient education)

Reference:

1. Strand LM, Morley PC, Cipolle RJ, Ramsey R, Lamsam GD. Drug-related problems: their structure and function. DICP 1990; 24 (11): 1093–1097.
2. Pharmaceutical Care Network Europe Foundation. PCNE Classification for Drug related problems V5.01. Zuidlaren: May 2006.

APPENDIX II.2 Drug Related Problems Descriptions

Table 25: Number of drug related problem (DRPs) descriptions

	Number of DRPs		
Modified Drug Related Problems Classification *	**1st Visit**	**2nd Visit**	**3rd Visit**
1. Untreated indication	**4 (11.1%)**	**8 (27.6%)**	**15 (57.7%)**
- The patient is in need of drug therapy but is not receiving it	3	0	0
- The new problem has not been identified or treated	0	2	3
- The continuity of drug therapy has been interrupted	1	2	1
- The patient is in need of prophylaxis or premedication	0	3	10
- The patient needs a synergistic or potentiating drug therapy	0	1	1
2. Improper drug selection	**2 (5.6%)**	**1 (3.4%)**	**2 (7.7%)**
- The drug therapy is ineffective	2	1	1
- The drug therapy has not evidence support	0	0	1
3. Sub-therapeutic dosage	**3 (8.3%)**	**2 (6.9%)**	**0 (0.0%)**
- The dose less than optimal	2	1	0
- Receive inappropriate dosage form	1	0	0
- Receive the expired or deteriorated drugs	0	1	0
4. Over-dosage	**0 (0.0 %)**	**0 (0.0 %)**	**1 (3.8%)**
- Conversions to difference route	0	0	1
5. Adverse drug reaction	**21(58.3%)**	**14(48.3%)**	**8 (30.8%)**
- Side effects – Type A ADR	20	14	8
- Drug allergy – Type B ADR	1	0	0
6. Drug interaction	**5 (13.9%)**	**4 (13.8%)**	**0 (0.0%)**
- Drug – drug interactions	5	4	0
7. Invalid indication	**1 (2.8%)**	**0 (0.0 %)**	**0 (0.0 %)**
Use the drug without indication	1	0	0
8. Compliance	**822**	**885**	**684**
- Not taking the medication as directed by the prescription	181	136	100
- Forget to take the medication as directed by the prescription	158	376	303
- Stop taking medicine without the doctor's permission	79	43	30
- Lack of medicine	18	74	50
- Not meeting with the doctor as appointed	27	23	10
- Excessive use the medication ; herbal, food supplement,	22	12	7
- Impropriate medicine storage	337	221	184
Total Drug Related Problems	**858**	**914**	**710**
Number of Patients	**288**	**274**	**263**

Modified from Strand LM, Morley PC, Cipolle RJ, Ramsey R, Lamsam GD. Drug-related problems: their structure and function. DICP 1990; 24 (11): 1093–1097.

APPENDIX C

Excessive Drug Cost Calculations

APPENDIX III.1: Excessive Drug Cost Formula

Excessive drug means the numbers of pills were not taken as the prescription at period

Excessive Drug Calculation

Excessive Drug = Actual pills - Exactly pills

Actual pills as

Number of actual pills that were received from physician during the visit period

Exactly pills as

Number of days at the first visit physician on period multiply by Number of pills per day as prescription

Excessive Drug Cost

Excessive Drug Cost = Excessive Drug X Cost of drug from national price index

APPENDIX D

RELIABILITY TEST

APPENDIX IV.1: Reliability Test of Satisfaction Questionnaires

Scale Statistics

Mean	Variance	Std. Deviation	Cronbach's Alpha	N of Items
3.332	.560	.478	.838	25

Item	Mean	Std. Deviation	N
S1	.88	1.358	193
S2	3.67	.570	193
S3	3.61	.699	193
S4	3.63	.608	193
S5	2.37	1.569	193
S6	3.64	.570	193
S7	3.69	.497	193
S8	3.72	.464	193
S9	3.73	.523	193
S10	3.77	.448	193
S11	3.56	.627	193
S12	3.59	.580	193
S13	3.59	.607	193
S14	3.53	.784	193
S15	1.18	1.459	193
S16	3.44	.871	193
S17	3.39	.836	193
S18	3.36	1.001	193
S19	3.61	.539	193
S20	3.59	.589	193
S21	3.41	.786	193
S22	3.16	1.056	193
S23	3.69	.486	193
S24	3.77	.424	193
S25	3.72	.494	193

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
S1	82.41	86.577	-.241	.	.872
S2	79.62	76.747	.527	.	.829
S3	79.68	75.509	.521	.	.828
S4	79.66	76.620	.502	.	.829
S5	80.93	76.182	.135	.	.857
S6	79.65	75.665	.640	.	.826
S7	79.61	76.230	.676	.	.827
S8	79.58	76.422	.702	.	.827
S9	79.57	76.851	.569	.	.829
S10	79.53	77.313	.612	.	.829
S11	79.73	74.625	.676	.	.824
S12	79.70	75.001	.696	.	.824
S13	79.71	74.822	.680	.	.824
S14	79.77	77.201	.328	.	.834
S15	82.11	82.581	-.090	.	.867
S16	79.85	73.416	.547	.	.826
S17	79.90	73.370	.577	.	.825
S18	79.94	73.434	.460	.	.829
S19	79.68	75.624	.684	.	.826
S20	79.70	75.688	.614	.	.827
S21	79.89	74.831	.506	.	.828
S22	80.13	74.951	.343	.	.835
S23	79.61	76.052	.713	.	.826
S24	79.53	77.271	.655	.	.829
S25	79.58	76.787	.612	.	.828

APPENDIX IV.2: Reliability Test of Modified Diabetes Quality of Life (modified DQOL) Questionnaires

Total scale test

Scale Statistics

Mean	Variance	Std. Deviation	Cronbach's Alpha	N of Items
4.201	0.76	0.872	.780	33

Item Statistics

	Mean	Std. Deviation	N
DM1	.61	.998	83
DM2	.10	.335	83
DM3	.86	.989	83
DM4	.61	.948	83
DM5	.45	1.003	83
DM6	.75	1.218	83
DM7	.17	.537	83
DM8	1.13	1.621	83
DM9	.58	1.083	83
DM10	.25	.713	83
DM11	.31	.748	83
DM12	.25	.746	83
DM13	.31	.810	83
DM14	.49	1.075	83
DM15	.29	.804	83
DM16	.55	1.003	83
DM17	.06	.239	83
DM18	.94	1.213	83
DM19	.43	1.002	83
DMA1	3.01	1.330	83
DMA2	2.76	1.470	83
DMA3	3.25	1.228	83
DMA4	3.16	1.254	83
DMA5	2.99	1.526	83
DMA6	2.98	1.189	83
DMA7	2.98	1.370	83
DMA8	3.06	1.443	83
DMA9	2.88	1.485	83
DMA10	3.13	1.295	83
DMA11	3.10	1.303	83
DMA12	3.04	1.383	83
DMA13	3.13	1.341	83
DMA14	3.17	1.314	83

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DM1	51.17	204.849	.228	.	.821
DM2	51.69	210.925	.136	.	.823
DM3	50.93	203.483	.280	.	.819
DM4	51.17	203.679	.288	.	.819
DM5	51.34	203.275	.283	.	.819
DM6	51.04	209.279	.046	.	.828
DM7	51.61	209.850	.143	.	.823
DM8	50.65	213.206	-.073	.	.837
DM9	51.20	207.579	.116	.	.825
DM10	51.53	208.667	.155	.	.822
DM11	51.47	215.520	-.169	.	.829
DM12	51.53	206.081	.267	.	.820
DM13	51.47	207.033	.201	.	.822
DM14	51.29	205.159	.197	.	.822
DM15	51.49	206.351	.232	.	.821
DM16	51.23	210.959	.014	.	.827
DM17	51.72	211.886	.061	.	.823
DM18	50.84	215.158	-.120	.	.833
DM19	51.35	206.767	.159	.	.823
DMA1	48.77	190.593	.545	.	.809
DMA2	49.02	193.438	.410	.	.815
DMA3	48.53	185.252	.766	.	.801
DMA4	48.63	189.383	.620	.	.807
DMA5	48.80	186.019	.577	.	.807
DMA6	48.81	197.279	.409	.	.815
DMA7	48.81	190.792	.520	.	.810
DMA8	48.72	185.032	.643	.	.804
DMA9	48.90	203.942	.147	.	.826
DMA10	48.65	186.523	.683	.	.804
DMA11	48.69	200.096	.287	.	.820
DMA12	48.75	185.313	.668	.	.804
DMA13	48.65	185.474	.687	.	.803
DMA14	48.61	187.459	.644	.	.805

APPENDIX IV.3: Reliability Test of Sub-scale DQOL Questionnaire

Modified Diabetes Quality of Life (DQOL)	Mean	Variance	Std. Deviation	Cronbach's Alpha	N of Items
Dimension1: Satisfaction in life and activity daily	4.485	0.288	0.537	.870	19
Dimension2: Satisfaction in diabetes disease impact	3.875	1.057	1.028	.877	6
Dimension3: Satisfaction in worries about diabetes	4.019	1.259	1.122	.933	8
Total	4.201	0.76	0.872	0.780	33

Dimension 1: Dimension1: Satisfaction in life and activity daily (19 items)

Scale Statistics

Mean	Variance	Std. Deviation	Cronbach's Alpha	N of Items
85.21	103.985	10.197	0.870	19

Item Statistics

	Mean	Std. Deviation	N
DM1	4.40	1.013	98
DM2	4.92	.310	98
DM3	4.16	.971	98
DM4	4.36	.955	98
DM5	4.51	1.028	98
DM6	4.18	1.213	98
DM7	4.80	.642	98
DM8	3.76	1.644	98
DM9	4.32	1.189	98
DM10	4.74	.764	98
DM11	4.69	.738	98
DM12	4.74	.737	98
DM13	4.69	.792	98
DM14	4.40	1.208	98
DM15	4.67	.859	98
DM16	4.34	1.084	98
DM17	4.93	.296	98
DM18	4.05	1.187	98
DM19	4.55	1.017	98

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DM1	80.82	91.203	.608	.674	.859
DM2	80.30	102.087	.287	.337	.871
DM3	81.05	96.606	.337	.301	.869
DM4	80.86	91.443	.637	.719	.858
DM5	80.70	90.623	.629	.694	.858
DM6	81.03	93.411	.388	.452	.869
DM7	80.42	99.091	.351	.453	.868
DM8	81.46	89.859	.367	.415	.876
DM9	80.90	88.732	.618	.582	.858
DM10	80.47	96.417	.465	.572	.865
DM11	80.52	99.737	.251	.393	.871
DM12	80.47	94.788	.603	.669	.861
DM13	80.52	94.355	.585	.783	.861
DM14	80.82	87.801	.651	.731	.857
DM15	80.54	93.921	.560	.749	.862
DM16	80.88	90.500	.597	.598	.859
DM17	80.29	102.639	.210	.262	.872
DM18	81.16	90.757	.522	.443	.863
DM19	80.66	91.999	.562	.571	.861

Dimension2: Satisfaction in diabetes disease impact

Scale Statistics

Mean	Variance	Std. Deviation	Cronbach's Alpha	N of Items
23.25	38.063	6.170	.877	6

Item Statistics

	Mean	Std. Deviation	N
DMA1	2.85	1.297	175
DMA2	2.73	1.432	175
DMA3	3.07	1.260	175
DMA4	2.89	1.236	175
DMA5	2.83	1.499	175
DMA6	2.89	1.080	175

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DMA1	19.41	26.748	.718	.551	.849
DMA2	19.53	26.400	.653	.489	.861
DMA3	19.18	26.675	.753	.598	.844
DMA4	19.37	26.969	.745	.584	.845
DMA5	19.42	25.786	.659	.462	.862
DMA6	19.36	29.933	.589	.377	.870

Dimension3: Satisfaction in worries about diabetes

Scale Statistics

Mean	Variance	Std. Deviation	Cronbach's Alpha	N of Items
32.15	80.606	8.978	.933	8

Item Statistics

	Mean	Std. Deviation	N
DMA7	3.97	1.348	106
DMA8	4.08	1.392	106
DMA9	3.87	1.448	106
DMA10	4.07	1.311	106
DMA11	3.92	1.378	106
DMA12	4.04	1.352	106
DMA13	4.10	1.330	106
DMA14	4.10	1.323	106

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
DMA7	28.18	61.368	.825	.771	.920
DMA8	28.08	60.089	.861	.813	.917
DMA9	28.28	67.881	.445	.384	.948
DMA10	28.08	61.697	.834	.774	.919
DMA11	28.23	65.053	.614	.488	.935
DMA12	28.11	60.673	.860	.808	.917
DMA13	28.05	60.369	.893	.888	.914
DMA14	28.05	61.322	.846	.762	.918

APPENDIX E: REFERRAL CASES DESCRIPTION AND RESPONDS

Table 26: Referral Cases Description and Responds

	Number of Response (n)	
Number of Patients	**34 (Refer)**	**19 (Accept)**
Drug Related Problems (DRPs) Classification *	**Cause**	**Physician Respond**
1. Untreated indication		
- The patient is in need of drug therapy but is not receiving it	Hypertension uncontrolled	Accept (2)
- The new problem has not been identified or treated		
- The continuity of drug therapy has been interrupted		
- The patient is in need of prophylaxis or premedication	Simvastatin,Aspirin, prophylaxis required	Not response
2. Improper drug selection		
- The drug therapy is ineffective		
- The drug therapy has not evidence support		
3. Sub-therapeutic dosage		
- The dose less than optimal		
- Receive inappropriate dosage form	Isordil dosage form	Accept (1)
- Receive the expired or deteriorated drugs		
4. Over-dosage	Over dosage i.e., Enarapril, Amplodipine, HCTZ	Accept (1) Adjust dosage as clinical result
- Drug duplication		
5. Adverse drug reaction		
- Side effects – Type A ADR (i.e., glibenclamide, Metformin, Enalapril)	Clinical symptom (hypoglycemia, cough) Dorner®-bleeding	Accept (3)
6. Drug interaction		
- Drug – drug interactions		
7. Invalid indication		
- Use the drug without indication		
8. Compliance		
- Not taking the medication as directed by the prescription	Uncontrolled symptoms	Accept (2) Drug adjusted
- Forget to take the medication as directed by the prescription	Loss follow up (i.e., clinical problems (diabetes uncontrolled, hypertension uncontrolled,)	
- Stop taking medicine without the doctor's permission		Accept (7) Drug received as clinical results
- Lack of medicine (i.e., clinical problems occurred,	Lack of medicine	Accept (3)
- Not meeting with the doctor as appointed	i.e., Insulin, hypertensive drug, Digoxin	

APPENDIX F

HOME HEALTH CARE CASE STUDY

Case Study

Key Issues
4 medical sources, more than 20 types of prescribed medications, medical usage problems, total cost of the medications.

Purposes
1. To identify processes of accessing medications.
2. To identify patients' behaviour towards medical usages.
3. To reflect the cost of treatments.

Medical Financial Rights: Universal Coverage (UC)
Medical Treatment Units
1. Chulalongkorn hospital (Own responsibility for the treatment fees)
2. Bangkok Public Health Centre No.15 – Lat phrao (UC card)
3. Pattana Medication Clinic Centre – Rama IX (Under Welfare official from a son)
4. Somdet Chaopraya hospital

Medical History: 80 years old, Thai married male.
Hypertension, CAD, Osteoarthritis**,** benign prostatic hyperplasia (BPH)
No records of smoking, drinking (neither alcohol nor caffeine)

Allergies: Chlortetracycline (rashes, breathlessness, chest pain)

Report in the first visit

Problem lists:
- **Clinical symptoms:** postural hypotension, dry mouth
- **Drug related Problems (DRPs) :** duplicate medicine, over dosage drug usage, drug interaction, improper drug use
- **Compliance:** redundant medication taken from various hospitals and health care providers, improper medication storage.

Actions:
1. Medication review
2. Patient counseling: Postural hypotension, suggest patients to only go to one hospital at a time.
3. Education giving: Inform patients to not stop taking medicine without physician's consultation

Table 27: Case study: patient's medications in 1st and 3rd visit

No.	Medication list	Number of medication in the 1st visit	Number of medication in the 3rd visit	Stop taking medication	Cost of drug (Baht)	Value of access of drug (Baht)
	Bangkok Public Health Center 15					
1	Atenolol 50 mg	188	179		0.73	
2	Aspirin 81 mg	66	(+90)136		0.30	
3	Simvastatin 10 mg	60	60	✕	1.75	105
4	Simvastatin 20 mg	483	483	✕	3.00	1449
5	Simvastatin 40 mg	149	149	✕	7.00	1043
6	Vitamin B1-6-12	247	194		0.18	
7	Ibuprofen 400 mg	45	45	✕	0.58	261
8	Ranitidine 150 mg	180	159		6.50	
	Chulalongkorn hospital (รพ.จุฬาลงกรณ์)					
9	Betaloc® 100 mg (Metoprolol)	172	(+180) 308		6.00	
10	Amlopine® 10 mg (Amlodipine)	62	46		5.00	
11	Prazosin 1 mg	674	586		3.80	
12	Furosemide 40 mg	375	313.5		3.06	
13	Lexemin® 100 mg (Fenofibrate)	117	(+90) 175	✕	3.60	630
14	Crestor® 10 mg (Rosuvastatin)	33.5	(+45) 67		38.00	
15	Neurobion	60	33		3.50	
	Pattana Medication Clinic Centre (ศูนย์แพทย์พัฒนา)					
16	Aprovel® 150 mg (Irbesartan)	60	60	✕	27.00	1620
17	Madiplot® 10 mg (Manidipine)	60	60	✕	9.00	540
18	Vitamin B complex	60	60	✕	9.00	540
19	Celebrex® 200 mg (Celecoxib)	6	6		25.00	
20	Norgesic	18	18		2.00	
21	Viartril-S (eq. to glucosamine sulfate 1,500 mg	4	42		12.00	
22	Lorazepam 1 mg	72	54		1.00	
23	Somdet Chaopraya hospital (รพ.สมเด็จเจ้าพระยา) Nortriptyline 25 mg	174	148		1.00	
						6,188

Report in the second visit

Problem lists:

- **Clinical symptoms:** uncontrolled hypotension, insomnia

- **Drug related Problems (DRPs):** Redundant drug taking

- **Compliance**
  1. Stop taking two medications, Furosemide 40 mg and Amlodipine 10 mg, without doctor's permission.
  2. Forget to take two medications, Prazosin 1 mg and Aspirin 81 mg.

Actions:

1. Medication review
2. Patient counseling: Postural hypotension, suggest patients to only go to one hospital at a time.
3. Education giving: Inform patients to not stop taking medicine without physician's consultation

Report in the third visit

Problem lists:

- **Clinical symptoms:** none
- **Drug related Problems (DRPs):** none

Follow up:

F/U Clinical symptoms: BP

F/U DRPs: Compliance; ensure the patient take the medications as directed by the doctor.

Conclusion on the problems

Problems caused by the heath care system

1. Redundant medication received by various doctors caused an overdose of the medication. In addition, having too many kinds of medications confused the patient as a result; the patient could not remember to take the medications as directed.
2. There were no connection among the health care units and the hospital. Therefore, redundant medication may lead to an overdose problem.
3. The national health care system gave too much more medications than the patient should be given.
4. A lack of co-operation between hospitals and community health care in chronic disease patients.

Problems caused by the patient's behaviour

1. The patient did not know about his health care rights, for example he visited health care units every three months and took some medicine back home every time because he was hesitated to tell the doctor that he had still gotten some medicine left. This was the reason of why his house was full of medicine.
2. The patient did not understand how to take medication safely. Therefore, the patient adjusted the medication by himself without asking the physicians.
3. As the patient had no education on the treatment, he decided to choose his own way of treatment.

Problems involving society

1. The government had to pay lots of money for the untaken medicine.
2. Patients cannot recover as expected them to be because the information at each site is not linked together.
3. A lack of medication awareness in patients and physicians
4. Patients do not understand what they can or cannot do using their rights on the health care system.

APPENDIX G

DATA COLLECTION FORM

APPENDIX VII.1 PATIENT HEALTH PROFILE (English version)

Patient ID □□□□-□□□-□□

Patient Health Profile: PHP

PHP 1: Personal Data

Name – Last name..... Gender..... Blood group.....

Identification number □-□□□□-□□□□□-□□-□ Date of Birth../...../..... Age..... years

Address:.....

..... Postal Code..... ☎ Telephone number.....

Financial right health care

- ❑ Universal Health Coverage card (Golden card) Primary Care Unit..... Refer to.....
- ❑ Social security card Owner's hospital.....
- ❑ Government officer Owner's card..... Owner's hospital.....
- ❑ Others (Please specify).....

The current hospital: 1..... 2..... 3.....

Person to notify in case of emergency:..... ☎ Telephone number..... Relationship.....

Map and location

PHP 2: General Data

1. The ability to read.
   - ❑ Readable ❑ Unreadable (Unschooled / Visual problems)
2. Highest level of education (Studying)
   - ❑ Unschooled ❑ Elementary ❑ Secondary
   - ❑ Diploma / Vocational Certificate / Higher Vocational Certificate ❑ Bachelor's degree or higher
3. Occupation
   - ❑ Student ❑ Trade / Business profile ❑ Employee / NGOs.
   - ❑ Government officer/ State Enterprises ❑ Other (Please specify) .....
4. Maritial Status
   - ❑ Single ❑ Married ❑ Divorced / Widowed / Separated
5. Personal income (monthly)
   - ❑ < 10,000 baht ❑ 10,000 – 30,000 baht ❑ 30,001 – 50,000 baht ❑ > 50,000 baht
6. Household income (monthly)
   - ❑ Unspecified ❑ < 10,000 baht ❑ 10,000 – 50,000 baht ❑ > 50,000 baht

Patient ID ☐☐☐☐-☐☐☐-☐☐

PHP 3: History Behavioral Health

Stress ❑ No ❑ Occasionally ❑ Frequently

Smoking ❑ No ❑ Yes (.....Cigarettes / day) for.....years

❑ Quite for.....years (ever for.....years)

Alcohol drinking ❑ No ❑ Occasionally ❑ Habitually (.....Glasses, Cup / day)

Coffee drinking ❑ No ❑ Occasionally ❑ Habitually (.....Glasses, Cup / day)

Tea drinking ❑ No ❑ Occasionally ❑ Habitually (.....Glasses, Cup / day)

Energy drinking ❑ No ❑ Occasionally ❑ Habitually (.....Bottles / day)

Soft drinks drinking ❑ No ❑ Occasionally ❑ Habitually (.....Bottles / day)

Instant diet on a regular basis ❑ Sweet ❑ Salty ❑ Hot ❑ Fatty ❑ Other (Please specify).....

Exercise ❑ Not Exercise ❑ Exercise by .....duration.....minutes /day

Rest Sleeping Duration.....hours/day from.....to.....

Drug Allergy ❑ No ❑ Allergic to.....Symptoms.....

Food Allergy ❑ No ❑ Allergic to.....Symptoms.....

Drug administration / management ❑ By myself ❑ Care giver / Relationship.....

Food administration / management ❑ By myself ❑ Care giver / Relationship.....

The additional information

Example the daily life of patients and their families, nature of occupation, style housing and environment, attitudes, religious beliefs and other factors that affect health and drug use etc.

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Recorder.....**Date**...../...../.....

Patient ID □□□□-□□□-□□

PHP 4: History of illness

Underlying Diseases	Disease details	Since a year / Period (years)	PHP 5: Family history
❑ Diabetes			❑
❑ Hypertension			❑
❑ Dyslipidemia			❑
❑ Cardiovascular disease			❑
❑ Cerebrovascular disease			❑
❑ Gout			❑
❑ Osteoarthritis			❑
❑ Liver disease			❑
❑ Renal disease			❑
❑ Migraine			❑
❑ Asthma			❑
❑ Allergy			❑
❑ Other 1.			❑
2.			❑

Chief complaints:

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Recorder.....**Date**...../...../.....

Patient ID □□□□-□□□-□□

Patient Medication Profile; PMP 1

No.	Drug list / Strength	Regimen (by Doctor)	Pill Count								Remarks
			Counting Date __/__/____	Refill Date __/__/__	Counting Date __/__/____	Refill Date __/__/__	Counting Date __/__/____	Refill Date __/__/__	Counting Date __/__/____	Refill Date __/__/__	
1											
2											
3											
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15											
16											
17											
18											
19											
20											
Date of appointment (Doctor)											
Recorder											

Patient ID □□□□-□□□-□□

Patient Self Medication Profile; PMP 2 (Medicine, Herbal, Supplementary)

No.	Drug list / Strength	How to use	Purchased from	Remarks
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				

Patient ID □□□□-□□□-□□

Pharmacist Screening Profile: RSP 1 (Laboratory data)

Date			___/___/___.		___/___/___.		___/___/___.		___/___/___.		___/___/___.	
Specification	Unit	Normal range	Pharmacy	Hospital	Pharmacy	Hospital	Pharmacy	Hospital	Pharmacy	Hospital	Pharmacy	Hospital
Weight	kg	-										
Height	cm	-										
BMI	%	18 – 23										
BP	mmHg	< 120 / 80										
HR	Bpm	70 – 80										
FBS	mg / dl	70 – 130										
Postprandial 2 hr	mg / dl	< 200										
HbA1c	%	6 – 7										
TC	mg / dl	< 200										
TG	mg / dl	< 150										
LDL-C	mg / dl	< 100										
HDL-C	mg /dl	> 40										
BUN	mg / dl	7 – 20										
SCr	mg / dl	0.5 – 1.5										
CrCl	ml / min/ 1.73 m^2	90 – 140										
Uric acid	mg / dl	< 7										
Albumin	g / dl	3.2 – 5.0										
AST	IU / L	< 35										
ALT	IU / L	< 35										
Alk. Phos.	IU / L	35 – 130										
Total bilirubin	mg / dl	0.1 – 1.2										
Direct bilirubin	mg / dl	0 – 0.3										
Other_____												

Note: The laboratory from other hospitals, please specify the date on which the inspection was taken and put in parentheses appended.

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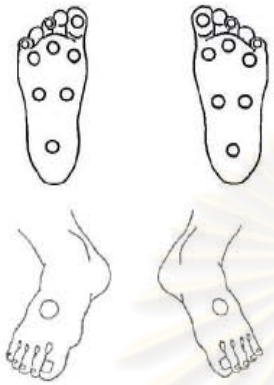
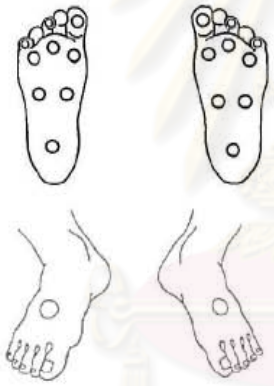
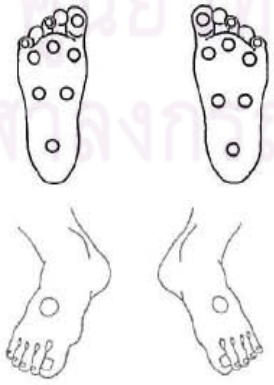
Patient ID □□□□-□□□-□□

RSP 2: Foot Screening

……………Visiting: Date……/……/………… 	**More detail** __________________. __________________. __________________. __________________. __________________. __________________. __________________. __________________. __________________. __________________. **Recorder**__________________.
……………Visiting: Date……/……/………… 	**More detail** __________________. __________________. __________________. __________________. __________________. __________________. __________________. __________________. __________________. __________________. **Recorder**__________________.
……………Visiting: Date……/……/………… 	**More detail** __________________. __________________. __________________. __________________. __________________. __________________. __________________. __________________. __________________. __________________. **Recorder**__________________.

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Patient ID □□□-□□□-□□

Pharmacist Counseling Profile: RCP

RCP1: Patient characteristics and problems	**RCP2**: Planning management
Visiting: Date ...../...../..... **Results / Problems list** **Actions**	**Recorder**_____

The additional descriptions:.....

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Patient ID □□□□-□□□-□□

Patient Medication Questionnaire Assessment: PMA*

PMA 1: Drug list regularly take "within 7 days ago" and answer the following questions for each item.

How many items do you take? Answer.....items

Respondents: ❑ Patient ❑ Care giver

a. Drug list / Strength / Appearance				b. How many pills do you take?	c. How many times a day?		d. How many times a week? **	e. How many times do you missing of / don't take these drugs **		f. Do you know what medicine is used for?	g. Is the medicine effective? **	h. Do you have any problems using this drug? ***	
No.	Drug list	Strength	Appearance		Frequency (Times/day)	Time to take	1. Everyday 2. Other day 3. Others.....	Times	Because of: 1. Forgot 2. Finished 3. Stopped		1. Well 2. Faire 3. Useless 4. Unspecified	Severity: 0. No problems 1. Not interfered 2. Mild 3. Modernte 4. Severe	More detail
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													

*Adapted from: Svarstad et al (1998), ** To be complete in number, *** To be complete in number and detail of a problem

Recorder_____**Date**____/____/_____

รหัสผู้ป่วย □□□-□□□□-□□□□

Patient Knowledge Assessment: PKA

PKA 1: Overall knowledge of the patient assessment

How do you think that you have knowledge about this?	I don't know	Faire 🕮	Good 🕮🕮	Excellent 🕮🕮🕮
1. Disease				
1.1 Disease / basic knowledge				
1.2 Goals / principles of treatment				
1.3 Complications knowledge				
2. Medicine				
2.1 Using medicines administration				
2.2 Special medicines technique (such as insulin, spray, MDI for asthma etc.)				
2.3 Adverse drug events and problem solving				
3. Food				
3.1 Food controlled for disease				
4. Health care and self-monitoring				
4.1 Exercise				
4.2 Weight control				
4.3 Blood pressure monitoring				
4.4 Blood glucose monitoring				
4.5 Treatment of common illnesses				
5. Other (Please specify)				
5.1 Foot care (for diabetes)				
5.2				
5.3				

PKA 2: Education plan

1. .....
2. .....
3. .....
4. .....
5. .....
6. .....
7. .....

Recorder.....**Date**...../...../.....

Patient ID □□□□□-□□□□-□□□□

Date.....Month.....Year.....

แบบฟอร์มการประเมินและส่งต่อผู้ป่วย (Pharmacist Referral Assessment: RRA)

Patient Name.....Gender.....Age.....year career.....

Address.....Phone.....

History of illness.....

Drug/food allergy.....Symptom.....Financial right health care.....

Referral by Pharmacist.....License number.....

Pharmacy Name.....Phone.....

Referral to

☐ Hospital.....☐ PCU .....

☐ Clinic.....☐ Others.....

Drug and supplement list

1.....

2.....

3.....

4.....

5.....

6.....

7.....

8.....

9.....

0.....

1.....

2.....

3.....

4.....

5.....

6.....

7.....

8.....

9.....

0.....

Cause to referral

To physician.....

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Pharmacist Intervention

☐ Medication review

☐ Consult patient

☐ Education patient or Education care giver

☐ Other.....

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Pharmacist Name.....

(.....)

Date.....

Patient ID □□□□-□□□□-□□□□

Date..... Month..... Year.....

ใบตอบกลับ (Physician Responded Form: PRF)

To community pharmacist

Patient name..... Gender..... Age..... year.....

Referral Result

Recommendation for therapy .....

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Request for follow up by pharmacist

☐ F/U Compliance.....

☐ F/U Clinical symptoms.....

☐ F/U ADRs.....

☐ F/U Drug interactions.....

☐ F/U Others.....

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Physician Name.....

(.....)

Date.....

Phone.....

APPENDIX VII.2 PATIENT HEALTH PROFILE (Thai version)

รหัสผู้ป่วย □□-□□□□□□-□□□□□

แบบบันทึกข้อมูลเบื้องต้นของผู้ป่วย (Patient Health Profile: PHP)

PHP 1: ประวัติส่วนบุคคล

ชื่อผู้ป่วย.....เพศ.....หมู่เลือด.....

เลขที่บัตรประจำตัวประชาชน □-□□□□-□□□□□-□□-□ วันเดือนปีเกิด...../...../.....อายุ.....ปี

ที่อยู่: บ้านเลขที่.....ซอย.....ถนน.....แขวง.....

เขต.....จังหวัด.....รหัสไปรษณีย์..... ☎ โทรศัพท์.....

สิทธิ์การรักษาพยาบาล ❑ ประกันสุขภาพ ปฐมภูมิ .....ส่งต่อ.....

❑ ประกันสังคม สถานพยาบาลตามสิทธิ.....

❑ ข้าราชการ/รัฐวิสาหกิจ เจ้าของสิทธิ์.....โรงพยาบาล.....

❑ อื่นๆ.....

สถานพยาบาลที่รักษาปัจจุบัน 1.....2.....3.....

กรณีฉุกเฉินติดต่อ: ชื่อ-นามสกุล..... ☎ โทรศัพท์.....เกี่ยวข้องเป็น.....

แผนที่ที่อยู่ผู้ป่วย

PHP 2: ประวัติทั่วไป

1. ความสามารถในการอ่านหนังสือ

❑ อ่านหนังสือได้ ❑ อ่านหนังสือไม่ได้ (อ่านหนังสือไม่ออก / มีปัญหาทางสายตา)

2. ระดับการศึกษาสูงสุดของท่าน (รวมที่กำลังศึกษาอยู่)

❑ ไม่ได้เรียนหนังสือ ❑ ประถมศึกษา ❑ มัธยมศึกษา

❑ อนุปริญญา / ปวส. / ปวช. ❑ ปริญญาตรีหรือสูงกว่า

3. อาชีพ

❑ นักเรียน / นักศึกษา ❑ ค้าขาย / ธุรกิจส่วนตัว ❑ พนักงานบริษัท / องค์กรเอกชน

❑ รับราชการ / เจ้าหน้าที่ของรัฐ / รัฐวิสาหกิจ ❑ อื่นๆ (โปรดระบุ).....

4. สถานภาพการสมรส

❑ โสด ❑ สมรส / อยู่ด้วยกัน ❑ หย่าร้าง / หม้าย / แยกกันอยู่

5. รายได้บุคคล (ต่อเดือน)

❑ < 10,000 บาท ❑ 10,000 – 30,000 บาท ❑ 30,001 – 50,000 บาท ❑ > 50,000 บาท

6. รายได้ครัวเรือน (ต่อเดือน)

❑ ไม่ทราบ ❑ < 10,000 บาท ❑ 10,000 – 50,000 บาท ❑ > 50,000 บาท

รหัสผู้ป่วย □□-□□□□□□-□□□□□

PHP 3: ประวัติพฤติกรรมสุขภาพ

ความเครียด	❑ ไม่เครียด	❑ บางครั้ง	❑ ประจำ	
การสูบบุหรี่	❑ ไม่สูบ	❑ สูบ (.....มวน / วัน) เป็นเวลา.....ปี	❑ เลิกสูบ.....ปี (เคยสูบ.....ปี)	
การดื่มแอลกอฮอล์	❑ ไม่ดื่ม	❑ ดื่มเป็นครั้งคราว	❑ ดื่มเป็นประจำ (.....แก้ว / วัน)	
การดื่มกาแฟ	❑ ไม่ดื่ม	❑ ดื่มเป็นครั้งคราว	❑ ดื่มเป็นประจำ (.....แก้ว / วัน)	
การดื่มชา	❑ ไม่ดื่ม	❑ ดื่มเป็นครั้งคราว	❑ ดื่มเป็นประจำ (.....แก้ว / วัน)	
การดื่มเครื่องดื่มชูกำลัง	❑ ไม่ดื่ม	❑ ดื่มเป็นครั้งคราว	❑ ดื่มเป็นประจำ (.....ขวด / วัน)	
การดื่มน้ำอัดลม / น้ำหวาน	❑ ไม่ดื่ม	❑ ดื่มเป็นครั้งคราว	❑ ดื่มเป็นประจำ (.....ขวด / วัน)	
รสอาหารที่รับประทานเป็นประจำ	❑ หวาน	❑ เค็ม	❑ เผ็ด	❑ อาหารมัน ❑ อื่นๆ (ระบุ).....

การออกกำลังกาย ❑ ไม่ออกกำลังกาย ❑ ออกกำลังกาย โดย .....ประมาณ.....นาที / วัน

การพักผ่อน นอนวันละ .....ชั่วโมง ช่วงเวลา.....

การแพ้ยา	❑ ไม่แพ้	❑ แพ้.....อาการ.....
การแพ้อาหาร	❑ ไม่แพ้	❑ แพ้.....อาการ.....
ผู้จัดยาให้ผู้ป่วย	❑ จัดเอง	❑ ผู้อื่น เกี่ยวข้องเป็น.....
ผู้ดูแลเรื่องอาหาร	❑ จัดเอง	❑ ผู้อื่น เกี่ยวข้องเป็น.....

ประวัติผู้ป่วย (เพิ่มเติม)

เช่น การดำเนินชีวิตประจำวันของผู้ป่วยและครอบครัว ลักษณะการประกอบอาชีพ ลักษณะที่อยู่อาศัยและสภาพแวดล้อม ความเชื่อและทัศนคติ ศาสนา ปัจจัยอื่นๆ ที่ส่งผลต่อสุขภาพและการใช้ยา ฯลฯ

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ผู้บันทึก.....**วันที่**...../...../.....

รหัสผู้ป่วย □□-□□□□□□-□□□□□

PHP 4: ประวัติการเจ็บป่วย

โรคประจำตัว	ระบุ รายละเอียดโรคเพิ่มเติม	ปีที่เริ่มเป็น / รวมระยะเวลา (ปี)	PHP 5: ประวัติครอบครัว
❑ เบาหวาน			❑
❑ ความดันโลหิตสูง			❑
❑ ไขมันในเลือดสูง			❑
❑ หัวใจและหลอดเลือด			❑
❑ เก๊าต์			❑
❑ ข้อเสื่อม			❑
❑ ตับ			❑
❑ ไต			❑
❑ ไมเกรน			❑
❑ หอบหืด			❑
❑ ภูมิแพ้			❑
❑ อื่นๆ 1.			❑
2.			❑

Chief complaint:

Visit 1: .....

.....

Visit 2: .....

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Visit 3: .....

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ผู้บันทึก ..... **วันที่** ...../...../.....

รหัสผู้ป่วย □□-□□□□□□-□□□□□

แบบบันทึกข้อมูลการใช้ยา / สมุนไพร / ผลิตภัณฑ์เสริมที่ได้รับจากแพทย์ของผู้ป่วย (Patient Medication Profile; PMP 1)

ลำดับที่	ชื่อยา / ความแรง	วิธีใช้ (แพทย์)	จำนวนที่นับได้								หมายเหตุ
			วันที่นับ __/__/____	รับยาเพิ่ม __/__/____	วันที่นับ __/__/____	รับยาเพิ่ม __/__/____	วันที่นับ __/__/____	รับยาเพิ่ม __/__/____	วันที่นับ __/__/____	รับยาเพิ่ม __/__/____	
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		วันที่แพทย์นัด									
		ลงชื่อผู้ตรวจนับ									

รหัสผู้ป่วย □□-□□□□□□-□□□□□

แบบบันทึกข้อมูลการใช้ยา / สมุนไพร / ผลิตภัณฑ์เสริมที่ผู้ป่วยซื้อใช้เอง (Patient Medication Profile; PMP 2)

ลำดับที่	ชื่อยา / ความแรง	วิธีใช้	สถานที่ซื้อ	หมายเหตุ
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รหัสผู้ป่วย □□-□□□□□□-□□□□□

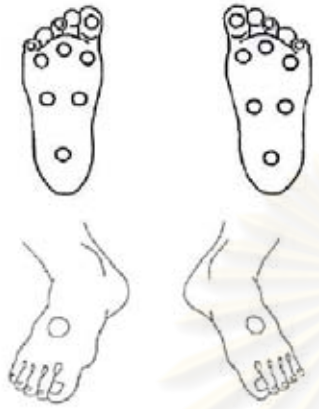
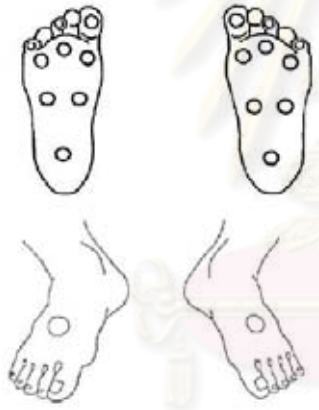
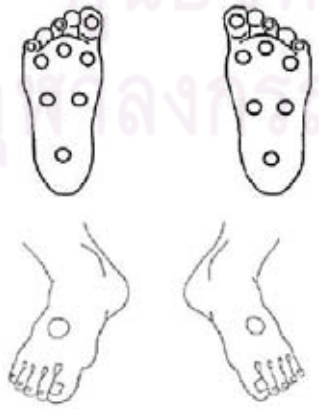
แบบบันทึกข้อมูลผลการตรวจทางห้องปฏิบัติการของผู้ป่วย (Pharmacist Screening Profile: RSP 1)

วัน / เดือน / ปี			___/___/___		___/___/___		___/___/___		___/___/___		___/___/___	
รายละเอียด	หน่วย	ค่าปกติ	ร้าน	สถานพยาบาล	ร้าน	สถานพยาบาล	ร้าน	สถานพยาบาล	ร้าน	สถานพยาบาล	ร้าน	สถานพยาบาล
น้ำหนัก	kg	-										
ส่วนสูง	cm	-										
BMI	%	18 – 23										
BP	mmHg	< 120 / 80										
HR	Bpm	70 – 80										
FBS	mg / dl	70 – 110										
Postprandial 2 hr	mg / dl	< 200										
HbA1c	%	6 – 7										
TC	mg / dl	< 200										
TG	mg / dl	< 150										
LDL-C	mg / dl	< 100										
HDL-C	mg / dl	> 40										
BUN	mg / dl	7 – 20										
SCr	mg / dl	0.5 – 1.5										
CrCl	ml / min / 1.73 m^2	90 – 140										
Uric acid	mg / dl	< 7										
Albumin	g / dl	3.2 – 5.0										
AST	IU / L	< 35										
ALT	IU / L	< 35										
Alk. Phos.	IU / L	35 – 130										
Total bilirubin	mg / dl	0.1 – 1.2										
Direct bilirubin	mg / dl	0 – 0.3										
อื่นๆ_____												

หมายเหตุ: การบันทึกผลตรวจทางห้องปฏิบัติการจากสถานพยาบาลอื่นๆ โปรดระบุวันที่ที่ได้รับการตรวจใส่ในวงเล็บต่อท้าย

รหัสผู้ป่วย □□-□□□□□□-□□□□□

RSP2: ผลการทดสอบความรู้สึกที่เท้า (Foot Screening)

ครั้งที่________: วันที่_____/_____/_______. 	**รายละเอียดเพิ่มเติม** ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ผู้บันทึก__________________________.
ครั้งที่________: วันที่_____/_____/_______. 	**รายละเอียดเพิ่มเติม** ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ผู้บันทึก__________________________.
ครั้งที่________: วันที่_____/_____/_______. 	**รายละเอียดเพิ่มเติม** ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ________________________________. ผู้บันทึก__________________________.

รหัสผู้ป่วย ☐☐-☐☐☐☐☐☐☐-☐☐☐☐☐

แบบบันทึกการติดตามการดูแลผู้ป่วย (Pharmacist Counseling Profile: RCP)

RCP1: ปัญหาและลักษณะผู้ป่วยที่พบ	RCP2: การวางแผนการแก้ไขปัญหา
การติดตามครั้งที่.....: วันที่_____/_____/_____ สิ่งที่พบ (Lifestyles, Clinical symptoms, DRPs) การดำเนินการ (Actions) ผู้บันทึก_____	การวางแผนการติดตามผลการแก้ไขปัญหา (Plans)

รหัสผู้ป่วย □□-□□□□□□-□□□□□

แบบประเมินการใช้ยาของผู้ป่วย (Patient Medication Questionnaire Assessment: PMA)*

PMA1: บอกรายการยาที่รับประทานเป็นประจำ "ในช่วง 7 วันที่ผ่านมา" และตอบคำถามต่อไปนี้สำหรับยาแต่ละรายการ

- ท่านมียาที่ท่านต้องรับประทาน จำนวน_____ชนิด

ผู้ตอบคำถาม: ❑ ผู้ป่วย ❑ ผู้จัดยา

ลำดับที่	a. ชื่อยา/ความแรง/ลักษณะเม็ดยา			b. ท่านรับประทานยานี้อยู่หรือไม่	c. ท่านรับประทานยานี้วันละกี่ครั้ง		d. ท่านรับประทานยานี้สัปดาห์ละกี่ครั้ง**	e. ท่านขาดยานี้กี่ครั้ง / ไม่ได้รับประทานยานี้กี่ครั้ง**		f. ท่านใช้ยานี้อย่างไร	g. ท่านรับประทานยานี้แล้วได้ผลดีหรือไม่ มาก-น้อยเพียงใด**	h. ท่านมีปัญหาจากการใช้ยานี้หรือไม่ ปัญหารบกวนมาก-น้อยเพียงใด***	
	ชื่อยา	ความแรง	ลักษณะเม็ดยา		จำนวนครั้ง/วัน	เวลาที่รับประทาน	1. ทุกวัน 2. วันเว้นวัน 3. อื่นๆ	จำนวนครั้ง	สาเหตุ: 1. ลืม 2. ยาหมด 3. หยุดยาเอง		1. ได้ผลดี 2. ได้ผลพอใช้ได้ 3. ไม่ได้ผล 4. ไม่รู้	ความรุนแรงของปัญหา: 0. ไม่มีปัญหา 1. ไม่รบกวน 2. รบกวนน้อย 3. รบกวนปานกลาง 4. รบกวนมาก	ลักษณะปัญหา
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รหัสผู้ป่วย □□□□-□□□□-□□□□

แบบประเมินภาพรวมความรู้ของผู้ป่วย (Patient Knowledge Assessment: PKA)

PKA1: การประเมินภาพรวมความรู้ของผู้ป่วย

ท่านคิดว่าท่านมีความรู้ในเรื่องต่อไปนี้อย่างไร	ไม่มีความรู้เลย	รู้บ้างเล็กน้อย 📖	รู้พอสมควร 📖📖	รู้มาก 📖📖📖
1. โรค				
1.1 ข้อมูลเรื่องโรคที่เป็นอยู่				
1.2 หลักการรักษาโรคที่เป็นอยู่				
1.3 ภาวะแทรกซ้อนที่อาจเกิดขึ้น				
2. ยา				
2.1 การใช้ยารักษาโรคที่เป็นอยู่				
2.2 การใช้ยาเทคนิคพิเศษ (ถ้ามี) เช่น การฉีดอินซูลิน ยาพ่นหอบหืด เป็นต้น				
2.3 อาการไม่พึงประสงค์จากยาและการแก้ไข				
3. อาหาร				
3.1 การควบคุมอาหารที่มีผลต่อโรคที่เป็นอยู่				
4. การป้องกัน ดูแลสุขภาพ และเฝ้าระวังตนเอง				
4.1 การออกกำลังกาย				
4.2 การควบคุมน้ำหนัก				
4.3 การตรวจวัดความดันโลหิต				
4.4 การตรวจวัดระดับน้ำตาลในเลือด				
4.5 การรักษาอาการเจ็บป่วยทั่วไป				
6. อื่นๆ (โปรดระบุ)				
6.1 การดูแลเท้า (สำหรับผู้ป่วยเบาหวาน)				
6.2				
6.3				

PKA2: การวางแผนการให้ความรู้

1. .....
2. .....
3. .....
4. .....
5. .....
6. .....

ผู้บันทึก..... วันที่ ... / ... / ...

รหัสผู้ป่วย □□□□□-□□□□-□□□□

วันที่.....เดือน.....พ.ศ.....

แบบฟอร์มการประเมินและส่งต่อผู้ป่วย (Pharmacist Referral Assessment: RRA)

ชื่อผู้ป่วย.....เพศ.....อายุ.....ปี อาชีพ.....

ที่อยู่.....โทรศัพท์.....

ประวัติการเจ็บป่วย.....

ประวัติการแพ้ยา/อาหาร.....อาการ.....สิทธิ์การรักษาพยาบาล.....

ส่งต่อโดยเภสัชกรชื่อ.....เลขที่ใบประกอบวิชาชีพ.....

ชื่อร้านยา.....โทรศัพท์.....

สถานที่ที่ส่งต่อ

☐ โรงพยาบาล.....☐ ศูนย์บริการสาธารณสุข.....

☐ คลินิค.....☐ อื่นๆ .....

รายการยาหรือผลิตภัณฑ์สุขภาพที่ใช้

1.....
2.....
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20.....

สาเหตุที่จำเป็นต้องส่งต่อผู้ป่วย

เรียน แพทย์ประจำตัวผู้ป่วย.....

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.....ด้วยความนับถือ

การดำเนินการของเภสัชกรให้กับผู้ป่วยเบื้องต้น

☐ Medication review

☐ Consult patient

☐ Education patient or Education care giver

☐ Other.....

.....

.....

.....

.....

.....

.....

ลงชื่อเภสัชกร .....

(.....)

วันที่.../...../.....

รหัสผู้ป่วย □□□□□-□□□□-□□□□

วันที่ .....เดือน.....พ.ศ.....

ใบตอบกลับ (Physician Responded Form: PRF)

ถึงเภสัชกรชุมชน

ชื่อผู้ป่วย.....เพศ.....อายุ.....ปี เบอร์โทรศัพท์.....

สรุปผลการส่งต่อ

ความคิดเห็นแพทย์ / การดำเนินการรักษา.....

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สิ่งที่ต้องการให้เภสัชกรติดตามเพิ่มเติม

☐ F/U Compliance.....

☐ F/U Clinical symptoms.....

☐ F/U ADRs.....

☐ F/U Drug interactions.....

☐ F/U Others.....

.....

.....

.....

ลงชื่อแพทย์.....

(.....)

วันที่.../...../.....

เบอร์โทรศัพท์.....

APPENDIX H

SATISFACTION
AND
HUMANISTIC ASSESSMENT FORM

Appendix VIII.1: Patient Satisfaction Assessment (English version)

ID □ □ □-□□ □-□□ □

Patient Satisfaction Assessment: PSA

Directions: Read each statement carefully. Please check an "X" in the space to indicate how satisfied or dissatisfied you currently are with aspect of your life described in the statement. There are no right no wrong answers to these questions. We are interacted in your opinion.

Section 1: Satisfaction evaluation on care team services

How satisfied or dissatisfied you currently are with aspect of your life described in the statement?	Satisfied		Neither	Dissatisfied		Remark
	Very	Moderately		Moderately	Very	
1. How satisfied are you with your comprehension on the pharmacist's advice?						
2. How satisfied are you with the pharmacist's willingness in taking care of you?						
3. How satisfied are you with the clarification of answers given by the pharmacist?						
4. How satisfied are you with the amount of time taken to give services?						
5. Is giving services every two weeks satisfactory?						
6. How satisfied are you with the care team's services according to equipment and process.						
7. Does the pharmacist dress appropriately?						
8. How satisfied are you with the pharmacist's conduct?						
9. How satisfied are you with the pharmacist home health care services on medication acknowledgement given by the project team?						
10. How satisfied are you with the benefits gained from the study project?						
11. How satisfied are you with your better comprehension when reading a label of medicine?						
12. Can you take your medicine as directed on the label?						
13. Do you know in where and how to keep your medicine?						
14. How satisfied are you with your improvement of your knowledge on medication?						
15. How satisfied are you with your remaining problems on how to take your medicine appropriately?						
16. How satisfied are you with your current medication?						
17. How satisfied are you with your ability to solve problems individually when forgotten to take your medication?						
18. Is your feeling towards your conditions satisfactory?						
19. How satisfied are you with your ability to take care of your health?						
20. How satisfied are you with your ability to control your diet?						

21. How satisfied are you with your ability to comply with what you have been instructed?						
22. Are your blood glucose level and your blood pressure satisfactory?						
23. How satisfied are you with your knowledge gained from the pharmacist?						
24. How satisfied are you with the pharmacist's services at your place?						
25. Will the service be satisfactory if it continues on in the future?						

Section 2: Speaking generally

1. Please state your opinion on the pharmacist's consultation on the areas of medicine and health care?

   .....

2. Should the services be continued? ❑ Yes ❑ No
3. Will you participate the services if they are held nearby your accommodation? ❑ Yes ❑ No
4. Have you got any inconvenience travelling to the pharmacy for the services? ❑ Yes ❑ No
5. Which channels are comfortable for you? (Please choose at least one or specify...)

   ❑ Home ❑ Community pharmacy ❑ Via telephone ❑ Others.....

6. Please state your opinion on putting this service in the national health system?
7. Will it be alright if you have to pay for the services at the pharmacy? ❑ Yes ❑ No
8. How much should the annual fee for the services be?

   .....

Recorder..... **Date** ..../..../.....

Appendix VIII.2: Patient quality of life assessment (English version)

ID □ □ □-□□ □-□□ □ □

Patient Quality of Life Assessment: PQLA

Section 3: Quality of life assessment (Adapted from Diabetes Control and Complication Trial (DCCT)

How often do you feel about this conditions	Frequency					Remark
	Never	Very Seldom	Some times	Often	All the time	
1. I feel pain associated with the treatment for my diabetes.						
2. I am embarrassed when dealing with my diabetes in public.						
3. My blood glucose level is low.						
4. I feel physically ill.						
5. My diabetes interferes with my family life.						
6. I have a bad night sleep.						
7. My diabetes limits my social relationship and friendships.						
8. I feel good about myself in the present.						
9. It is hard for me to control my diet						
10. My diabetes interferes with my sex life.						
11. My diabetes keeps me from driving a car or using a machine						
12. My diabetes interferes with my exercising.						
13. I can't do my work, school or chores because of my diabetes.						
14. I realize that the diabetes related to my daily life and my lifestyle.						
15. I realize that the diabetes related to my enjoyment of activities done during my leisure time.						
16. Being a diabetic, I have to keep explaining about my conditions to others						
17. People make fun of my diabetes.						
18. Being a diabetic, I need to go to the toilet more often than others.						
19. I would rather eat forbidden food than tell others about my diabetes.						
20. Answer this question only if you are having insulin injections. I hide the fact that I am having insulin injections from others.						

How satisfied or dissatisfied you currently are with aspect of your life described in the statement?	Satisfied		Neither	Dissatisfied		Remark
	Very	Moderately		Moderately	Very	
21. How satisfied are you with the amount of time you spend taking care of your diabetes?						
22. How satisfied are you with the amount of time you spend seeing a doctor for checkups?						
23. How satisfied are you with your current diabetes treatment?						
24. How satisfied are you with the flexibility in your diet?						
25. How satisfied are you with the burden your diabetes is placing on your family?						
26. How satisfied are you with your knowledge about your diabetes?						
27. How satisfied are you with your sleep?						
28. How satisfied are you with your social relationships and friendships?						
29. How satisfied are you with your sex life?						
30. How satisfied are you with your work, school and household activities?						
31. How satisfied are you with the appearance of your body?						
32. How satisfied are you with the time you spend exercising?						
33. How satisfied are you with your leisure time?						
34. How satisfied are you with your life generally?						

Recorder.....**Date**...../...../.....

Appendix VIII.3: Patient Satisfaction Assessment (Thai version)

รหัสผู้ป่วย □ □□□□ □□□□□ □□ □

แบบประเมินความพึงพอใจของผู้ป่วย

(Patient Satisfaction Assessment: PSA)

ใส่เครื่องหมาย " X " ลงในช่องว่างที่แสดงถึงความรู้สึกพึงพอใจของตัวท่านต่อกิจกรรม และ แสดงถึงระดับความถี่ว่าความรู้สึกที่เกิดกับท่านมากน้อยเพียงใด

ส่วนที่ 1 แบบประเมินความพึงพอใจเกี่ยวกับการให้บริการ

ท่านคิดว่าท่านมีความพึงพอใจ ต่อหัวข้อดังกล่าวนี้อย่างไร	เห็นด้วยอย่างยิ่ง	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง	ความคิดเห็นเพิ่มเติม
1. การให้ความรู้และคำปรึกษาของเภสัชกรเข้าใจยาก						
2. เภสัชกรสนใจและใส่ใจในปัญหาของท่าน						
3. ท่านรู้สึกว่าเภสัชกรตอบคำถามได้ชัดเจน						
4. เภสัชกรใช้เวลาในการให้บริการแต่ละครั้งเหมาะสม						
5. ท่านคิดว่าเภสัชกรมาให้บริการบ่อยเกินไป (2 สัปดาห์ครั้ง)						
6. ความพร้อมของอุปกรณ์ในการให้บริการ (เครื่องวัดความดัน, เครื่องตรวจทดสอบความรู้สึกของฝ่าเท้า,กล่องเก็บยา)						
7. ท่านคิดว่าเภสัชกรแต่งกายน่าเชื่อถือ						
8. ท่านพอใจกับการวางตัวของเภสัชกรระหว่างการให้บริการ						
9. ท่านพอใจการให้บริการโดยเภสัชกรเรื่องยาที่บ้าน						
10. ท่านรู้สึกว่าได้ประโยชน์จากการดูแลของเภสัชกร						
11.ท่านสามารถอ่านฉลากยาได้เข้าใจมากขึ้น						
12.ท่านรับประทานยาตรงตามที่ระบุในฉลาก						
13. ท่านสามารถเก็บยาได้อย่างถูกวิธี						
14. ท่านมีความรู้เรื่องการใช้ยาเพิ่มขึ้น						
15.ท่านยังคงมีปัญหาเกี่ยวกับการรับประทานยา						
16.ท่านไม่รู้สึกเป็นกังวลต่อยาที่ท่านใช้อยู่						
17.ท่านสามารถแก้ไขปัญหาได้ด้วยตนเองเมื่อลืมรับประทานยา						
18.ท่านไม่รู้สึกกลัวต่ออาการหรือโรคที่เป็นอยู่						
19.ท่านเข้าใจวิธีการดูแลสุขภาพของตนเองได้ดีขึ้น						
20.ท่านเข้าใจวิธีการดูแลและควบคุมการรับประทานอาหารได้ดีขึ้น						
21.ท่านสามารถปฏิบัติตัวตามที่เภสัชกรแนะนำ						
22.ระดับน้ำตาลในเลือดหรือระดับความดันโลหิตของท่านน อยู่ในระดับที่น่าพอใจ						
23.ท่านเข้าใจความรู้ที่ได้รับจากเภสัชกร						
24.ท่านพอใจกับการได้รับบริการจากเภสัชกรที่บ้าน						
25.ท่านต้องการ เภสัชกรดูแลเรื่องยาอย่างสม่ำเสมอ						

ส่วนที่ 2 แบบสอบถามทั่วไป

1. ท่านมีความคิดเห็นอย่างไรที่เภสัชกรได้ให้คำปรึกษา รวมถึงการให้ความรู้เรื่องยาและการดูแลสุขภาพ

.....

2. ท่านคิดว่าควรมีบริการให้คำปรึกษาและความรู้เรื่องยาและการดูแลสุขภาพต่อไปหรือไม่ □ ควรมี □ ไม่ควรมี

3. หากมีบริการดังกล่าวที่ร้านยาใกล้บ้านท่านจะ □ ไป □ ไม่ไป

4. หากมีบริการดังกล่าวที่ร้านยาท่านจะสะดวกไปหรือไม่ □ สะดวก □ ไม่สะดวก

5. ช่องทางที่เหมาะสมในการรับบริการ □ ที่บ้าน □ ร้านยาในชุมชน □ โทรศัพท์ □ อื่นๆ (โปรดระบุ).....

5. ท่านมีความคิดเห็นอย่างไรหากบริการดังกล่าวนี้จัดอยู่ในหลักประกันสุขภาพ

.....

5. หากมีบริการดังกล่าวนี้ที่ร้านยาภายในชุมชน ท่านยินดีที่จะเสียค่าบริการหรือไม่ □ ยินดี □ ไม่ยินดี

6. ท่านคิดว่าความเหมาะสมของค่าบริการต่อปีควรอยู่ที่ระดับเท่าใด.....บาท

ผู้บันทึก ..... วันที่...../...../.....

Appendix VIII.4: Patient Quality of Life Assessment (Thai version)

รหัสผู้ป่วย □ □□□□ □□□□□ □□ □

แบบประเมินคุณภาพชีวิตของผู้ป่วยโรคเบาหวาน (Patient Quality of Life Assessment: PQLA)

ส่วนที่ 3 แบบประเมินคุณภาพชีวิต

ความรู้สึกที่เกิดขึ้นเกี่ยวกับสภาวะเบาหวานของท่าน	ระดับความถี่ในการเกิดเหตุการณ์					ความคิดเห็น
	ไม่เคยเลย	แทบจะไม่เคย	บางครั้ง	บ่อยๆ	เป็นตลอดเวลา	
1. รู้สึกเจ็บปวดอันเนื่องมาจากการรักษาโรค						
2. รู้สึกอายบุคคลรอบข้างในการใช้ยาเบาหวาน						
3. เกิดภาวะน้ำตาลในเลือดต่ำ						
4. รู้สึกไม่สบายหรือเจ็บป่วย						
5. รู้สึกว่าการเป็นเบาหวานมีผลกระทบหรือรบกวนชีวิตครอบครัวของท่าน						
6. รู้สึกว่านอนหลับได้ไม่เต็มที่						
7. รู้สึกว่าการเป็นเบาหวานจำกัดการมีเพื่อนและการเข้าสังคม						
8. รู้สึกพึงพอใจในการดำรงชีวิตในปัจจุบัน						
9. รู้สึกลำบากในการควบคุมอาหาร						
10. รู้สึกว่าการเป็นเบาหวานขัดขวางการมีเพศสัมพันธ์						
11. รู้สึกว่าการเป็นเบาหวานขัดขวางการขับยานพาหนะและการใช้เครื่องมือต่างๆ						
12. รู้สึกว่าการเป็นเบาหวานขัดขวางการออกกำลังกาย						
13. รู้สึกว่าการเป็นเบาหวานทำให้ขาดงาน, การทำงานบ้านต่างๆ						
14. รู้สึกต้องบอกตนเองว่าการเป็นเบาหวานมีความเกี่ยวข้องกับการดำเนินชีวิต						
15. รู้สึกว่าการเป็นเบาหวานรบกวนการใช้เวลาว่าง, เวลาพักผ่อนของท่าน						
16. รู้สึกว่าการเป็นเบาหวานทำให้ต้องอธิบายเกี่ยวกับเบาหวานให้คนอื่นๆฟัง						
17. รู้สึกว่าตนเองถูกล้อเลียนเกี่ยวกับการเป็นเบาหวาน						
18. รู้สึกว่าการเป็นเบาหวานทำให้ต้องเข้าห้องน้ำบ่อยกว่า คนอื่น						
19. ต้องกินอาหารบางอย่างที่ไม่ควรกินเพราะว่ารู้สึกลำบากในการที่จะบอกว่าเป็นเบาหวาน						
20. ปกปิดคนอื่นๆว่าตนเองใช้ยาอินซูลิน (หากท่านไม่ได้ใช้อินซูลินไม่ต้องตอบข้อนี้)						

รหัสผู้ป่วย □ □□□□ □□□□□ □□ □

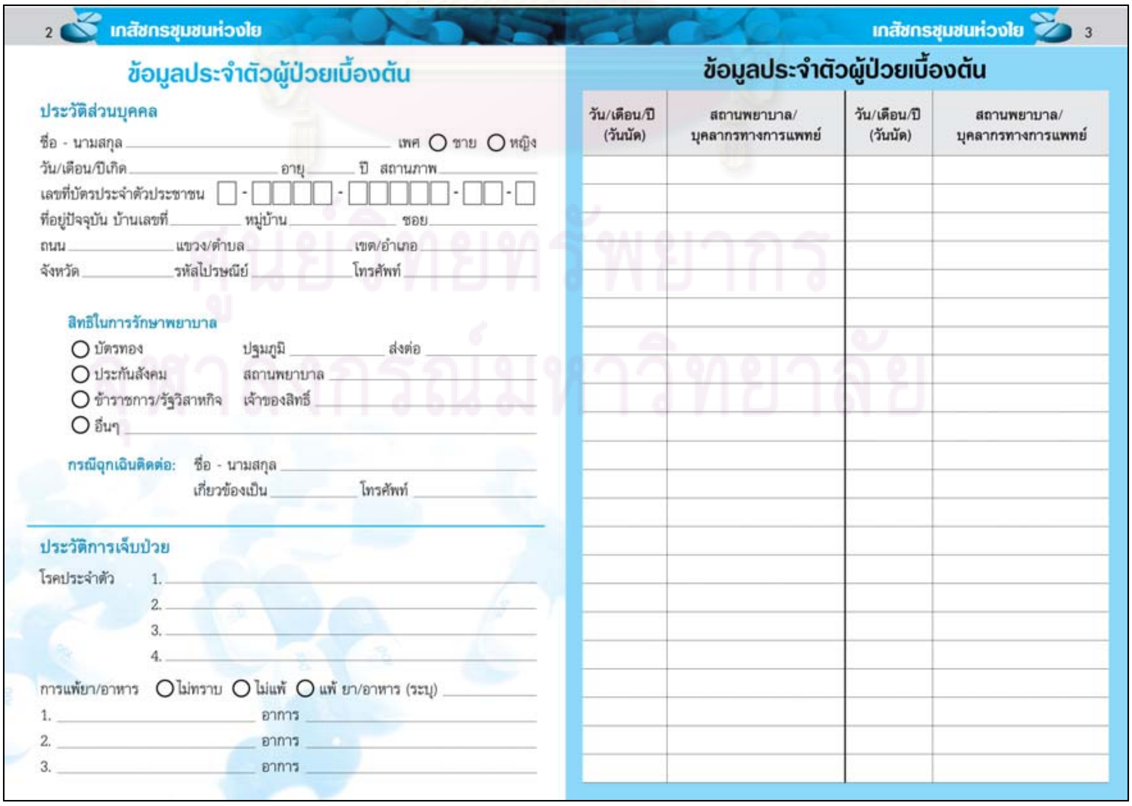
ส่วนที่ 3 แบบประเมินคุณภาพชีวิต (ต่อ)

ท่านคิดว่าท่านมีความพึงพอใจต่อหัวข้อดังกล่าวนี้อย่างไร	เห็นด้วยอย่างยิ่ง	เห็นด้วย	ไม่แน่ใจ	ไม่เห็นด้วย	ไม่เห็นด้วยอย่างยิ่ง	ความคิดเห็นเพิ่มเติม
1. ปริมาณเวลาที่ท่านใช้ในการดูแลตนเองจากโรคเบาหวาน						
2. ปริมาณเวลาที่ท่านใช้ในการไปพบแพทย์ตามนัดเพื่อติดตามผลการรักษา						
3. วิธีการรักษาโรคเบาหวานในปัจจุบันของท่าน						
4. ความยืดหยุ่นในเรื่องการควบคุมอาหารที่ท่านรับประทาน						
5. บุคคลในครอบครัวไม่ได้มีภาระมากในการต้องดูแลท่าน						
6. ความรู้ที่ท่านมีเกี่ยวกับเบาหวาน						
7. ภาวการณ์นอนหลับที่เพียงพอกับความต้องการ						
8. ความสัมพันธ์ต่อเพื่อนฝูงและสังคม						
9. การมีเพศสัมพันธ์ที่เหมาะสม						
10. การทำงาน, การเรียนหรือการทำงานบ้านได้อย่างเหมาะสม						
11. การมีรูปร่างลักษณะที่เหมาะสมกับวัย						
12. การมีเวลาที่เพียงพอในการออกกำลังกาย						
13. การมีเวลาพักผ่อนที่เพียงพอ						
14. ชีวิตโดยรวมของท่านเป็นอย่างไร						

APPENDIX I

PATIENT RECORD BOOK

Patient Record Book (สมุดบันทึกการใช้ยาผู้ป่วย)



2 เภสัชกรชุมชนห่วงใย

ข้อมูลประจำตัวผู้ป่วยเบื้องต้น

ประวัติส่วนบุคคล

ชื่อ - นามสกุล ______ เพศ ◯ ชาย ◯ หญิง

วัน/เดือน/ปีเกิด ______ อายุ ______ ปี สถานภาพ ______

เลขที่บัตรประจำตัวประชาชน ☐-☐☐☐☐-☐☐☐☐☐-☐☐-☐

ที่อยู่ปัจจุบัน บ้านเลขที่ ______ หมู่บ้าน ______ ซอย ______

ถนน ______ แขวง/ตำบล ______ เขต/อำเภอ ______

จังหวัด ______ รหัสไปรษณีย์ ______ โทรศัพท์ ______

สิทธิในการรักษาพยาบาล

◯ บัตรทอง ปฐมภูมิ ______ ส่งต่อ ______

◯ ประกันสังคม สถานพยาบาล ______

◯ ข้าราชการ/รัฐวิสาหกิจ เจ้าของสิทธิ์ ______

◯ อื่นๆ ______

กรณีฉุกเฉินติดต่อ: ชื่อ - นามสกุล ______

เกี่ยวข้องเป็น ______ โทรศัพท์ ______

ประวัติการเจ็บป่วย

โรคประจำตัว 1. ______
2. ______
3. ______
4. ______

การแพ้ยา/อาหาร ◯ ไม่ทราบ ◯ ไม่แพ้ ◯ แพ้ ยา/อาหาร (ระบุ) ______

1. ______ อาการ ______
2. ______ อาการ ______
3. ______ อาการ ______

เภสัชกรชุมชนห่วงใย 3

ข้อมูลประจำตัวผู้ป่วยเบื้องต้น

วัน/เดือน/ปี (วันนัด)	สถานพยาบาล/ บุคลากรทางการแพทย์	วัน/เดือน/ปี (วันนัด)	สถานพยาบาล/ บุคลากรทางการแพทย์

ข้อมูลประจำตัวผู้ป่วยเบื้องต้น

วัน/เดือน/ปี (วันนัด)	สถานพยาบาล/ บุคลากรทางการแพทย์	วัน/เดือน/ปี (วันนัด)	สถานพยาบาล/ บุคลากรทางการแพทย์

โรคเบาหวาน
Diabetes Mellitus

ภาวะน้ำตาลในเลือดสูง

อาการ

1. หิวบ่อย
2. ปัสสาวะบ่อย
3. น้ำหนักลดโดยไม่ทราบสาเหตุ
4. ตามัว
5. แผลหายช้า
6. ติดเชื้อทางเดินปัสสาวะ
7. อาการทางผิวหนัง เช่น คันตามตัว

*** หากมีอาการดังกล่าวติดต่อกันเป็นเวลามากกว่า 1 เดือน ให้รีบไปพบแพทย์เพื่อตรวจวินิจฉัย ***

ภาวะน้ำตาลในเลือดต่ำ

อาการ

1. มือสั่น ใจสั่น
2. หน้ามืด มึนงง
3. เหงื่อออกมาก อ่อนเพลีย
4. ปวดหัว

วิธีการแก้ไข

1. ดื่มน้ำผลไม้ / น้ำหวานครึ่งแก้ว
2. อมลูกกวาด

หากอาการไม่ดีขึ้นใน 10-15 นาที สามารถทำซ้ำได้

▪ ระดับน้ำตาลในเลือดเท่าไหร่...ถึงจะเป็นเบาหวาน

การตรวจวัด	ค่าแสดง (มก./ ดล.)	ภาวะอาการ	เกณฑ์ที่ดี
1. อดอาหารอย่างน้อย 8 ชั่วโมง, Fasting Plasma Glucose (FPG), Impaired Fasting Glucose (IFG)	< 100 100 - 125 ≥ 126	ปกติ เสี่ยง เบาหวาน	70-130
2. การเจาะตรวจน้ำตาลปลายนิ้ว หลังอาหาร 2 ชั่วโมง	≥ 200	เบาหวาน	< 180
3. Hemoglobin A (HbA1c) ฮีโมโกลบิน เอ (HbA1c)	≥ 7.0%	เบาหวาน	< 7.0%

บันทึกผลการตรวจ ระดับน้ำตาลในเลือด

วันที่ตรวจ (ว/ด/ป)	เวลาที่ตรวจ	ค่าน้ำตาลในเลือด (มก. / ดล.)		HbA1c (%)	ผู้ตรวจ	หมายเหตุ
		อดอาหาร 8 ชม.	เจาะปลายนิ้ว			

บันทึกผลการตรวจ ระดับน้ำตาลในเลือด

วันที่ตรวจ (ว/ด/ป)	เวลาที่ตรวจ	ค่าน้ำตาลในเลือด (มก. / ดล.)		HbA1c (%)	ผู้ตรวจ	หมายเหตุ
		อดอาหาร 8 ชม.	เจาะปลายนิ้ว			

บันทึกผลการตรวจ ระดับน้ำตาลในเลือด

วันที่ตรวจ (ว/ด/ป)	เวลาที่ตรวจ	ค่าน้ำตาลในเลือด (มก. / ดล.)		HbA1c (%)	ผู้ตรวจ	หมายเหตุ
		อดอาหาร 8 ชม.	เจาะปลายนิ้ว			

บันทึกผลการตรวจ ระดับน้ำตาลในเลือด

วันที่ตรวจ (ว/ด/ป)	เวลาที่ตรวจ	ค่าน้ำตาลในเลือด (มก. / ดล.)		HbA1c (%)	ผู้ตรวจ	หมายเหตุ
		อดอาหาร 8 ชม.	เจาะปลายนิ้ว			

บันทึกผลการตรวจ ระดับน้ำตาลในเลือด

วันที่ตรวจ (ว/ด/ป)	เวลาที่ตรวจ	ค่าน้ำตาลในเลือด (มก. / ดล.)		HbA1c (%)	ผู้ตรวจ	หมายเหตุ
		อดอาหาร 8 ชม.	เจาะปลายนิ้ว			

ความดันโลหิตสูง
Hypertension

ก่อนตรวจวัด 30 นาที ควร :

- งดดื่มน้ำชา, กาแฟ
- งดออกกำลังกาย
- หลีกเลี่ยงรับประทานยาจำพวกยาคุมกำเนิด, ยากลุ่มสเตอรอยด์ หรือ ยากลุ่มแก้คัดจมูก

• ความดันโลหิตเท่าไหร่...จึงเรียกว่า ความดันโลหิตสูง

ประเภท	ความดันโลหิตค่าบน[1] (มม.ปรอท)		ความดันโลหิตค่าล่าง[2] (มม.ปรอท)
ความดันโลหิตปกติ	ต่ำกว่า 120	และ	ต่ำกว่า 80
ความดันโลหิตค่อนข้างสูง (เฝ้ายังที่จะเป็นความดันโลหิตสูง)	120 - 139	หรือ	80 - 89
ความดันโลหิตสูง ระดับที่ 1	140 - 159	หรือ	90 - 99
ความดันโลหิตสูง ระดับที่ 2	ตั้งแต่ 160 ขึ้นไป	หรือ	ตั้งแต่ 100 ขึ้นไป

หมายเหตุ:
- **ค่าบน (Systolic)** = ค่าสูงสุดที่แสดงการบีบตัวของหัวใจ (เลือดออกจากหัวใจไปส่วนต่างๆ ของร่างกาย)
- **ค่าล่าง (Diastolic)** = ค่าต่ำสุดที่แสดงการขยายตัวของหัวใจ (ความยืดหยุ่นของหลอดเลือด)

• ภาวะระดับไขมันในเลือดผิดปกติ (Dyslipidemia)
การประเมินผลระดับไขมันในเลือด

ประเภท	ดีมาก	ดี	พอใช้	แย่
Cholesterol - TC (มก. / ดล.)	< 200	200 - 220	221 - 240	> 240
Triglyceride - TG (มก. / ดล.)	< 150	150 - 200	201 - 240	> 240
HDL - Cholesterol (มก. / ดล.)	> 40	35 -40	30 -34	< 30

บันทึกผลการตรวจวัด *ความดันโลหิต*

วันที่ตรวจ (ว/ด/ป)	เวลาที่ตรวจ	ค่าความดันโลหิต (mmHg)		ชีพจร (ครั้ง/นาที)	ผู้ตรวจ	หมายเหตุ
		ค่าบน	ค่าล่าง			

บันทึกผลการตรวจวัด *ความดันโลหิต*

วันที่ตรวจ (ว/ด/ป)	เวลาที่ตรวจ	ค่าความดันโลหิต (mmHg)		ชีพจร (ครั้ง/นาที)	ผู้ตรวจ	หมายเหตุ
		ค่าบน	ค่าล่าง			

อาการที่ท่านควรรีบ *ปรึกษา แพทย์, เภสัชกร, พยาบาล*

- เจ็บหน้าอกอย่างรุนแรงคล้ายมีอะไรมากดบีบรัดบริเวณใต้กระดูกหน้าอกตรงกลาง อาจเจ็บร้าวไปถึงขากรรไกรและแขนซ้าย และอาจมีอาการต่อไปนี้ร่วมด้วย เช่น เหงื่อออก คลื่นไส้ หายใจลำบาก หน้ามืดคล้ายจะเป็นลม หรือหมดสติ
- เจ็บบริเวณหน้าอกหรือท้องอย่างเฉียบพลัน และรุนแรงร้าวทะลุไปถึงหลัง
- เหนื่อยง่ายผิดปกติ ใจสั่น ชีพจรเต้นไม่เป็นจังหวะ
- ปวดศีรษะเฉียบพลัน ร่วมกับอาการปวดตึงบริเวณท้ายทอย โดยเฉพาะมีอาการอาเจียนร่วมด้วย
- ปวดศีรษะบริเวณท้ายทอยและขมับทั้ง 2 ข้าง ร่วมกับอาการตามัว
- แขน ขา ซีกใดซีกหนึ่งอ่อนแรงหรือมีอาการชา แม้จะเป็นเวลาสั้นๆ และหายได้เองก็ตาม
- ตาข้างใดข้างหนึ่ง มองไม่เห็นอย่างเฉียบพลันในระยะเวลาเป็นนาที และกลับมองเห็นได้ดีคงเดิม
- ขาบวมตอนสายๆ โดยเฉพาะมีอาการหน้าบวมในตอนเช้าด้วย
- มีอาการปวดขาข้างใดข้างหนึ่ง หรือทั้งสองข้าง หลังจากเดินระยะไม่ไกลต้องหยุดพักให้หายปวด แล้วจึงจะเดินต่อได้ และระยะทางที่เดินได้ในครั้งต่อๆ มาจะสั้นลง

สายด่วน - ฉุกเฉิน

1330	สายด่วน สำนักงานหลักประกันสุขภาพแห่งชาติ (สปสช.)
1506	สายด่วน สำนักงานประกันสังคม (สปส.)
1166	สายด่วน ร้องทุกข์ คุ้มครองผู้บริโภค (สคบ.)
1556	สายด่วน ผู้บริโภค กับ อย.
1555	สายด่วน กรุงเทพมหานคร (กทม.)
1554	หน่วยแพทย์กู้ชีพ กทม.
1669	ศูนย์กู้ชีพ นเรนทร
1691	ศูนย์ส่งกลับและรถพยาบาล กรมตำรวจ
1667	สายด่วน ฮอทไลน์ คลายเครียด (กรมสุขภาพจิต)
1300	สายด่วน ศูนย์ประชาบดี
02-282-3892	ศูนย์สวัสดิภาพเด็ก เยาวชน และสตรี
02-713-6793	ศูนย์รับปรึกษาปัญหาทางโทรศัพท์

Website ข้อมูลด้านสุขภาพ

http://www.moph.go.th
http://www.oryor.com
http://www.fda.moph.go.th
http://www.gpo.or.th
http://www.thaihealth.or.th
http://www.pharcpa.com
http://drug.pharmacy.psu.ac.th
http://www.pharm.chula.ac.th/osotsala/
http://www.med.cmu.ac.th/hospital/dis/main.htm

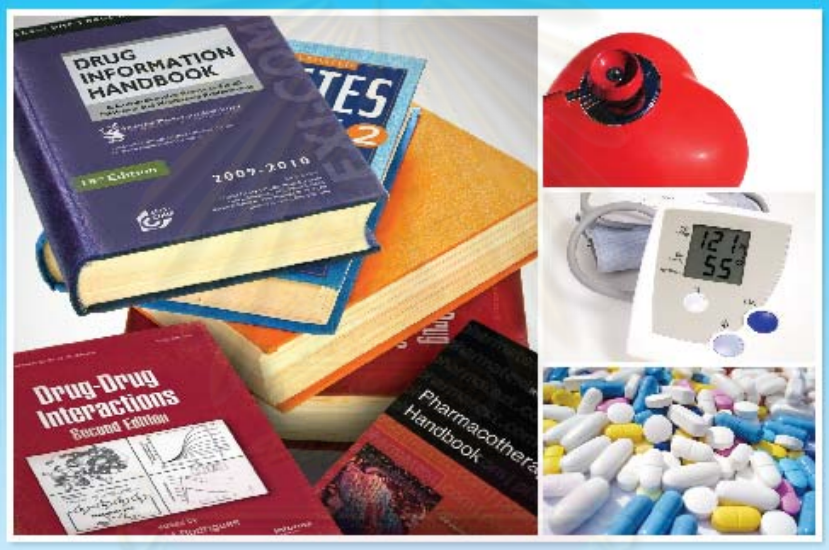
รายการยา / ผลิตภัณฑ์สุขภาพที่ได้รับจากแพทย์

ชื่อยา	ความแรง	รูปเม็ดยา	วิธีรับประทาน / ใช้ยา								หมายเหตุ (วันที่รับ - หยุดยา)
			ครั้งละ	วันละ (ครั้ง)	ก่อนอาหาร	หลังอาหาร	เช้า	เที่ยง	เย็น	ก่อนนอน	

APPENDIX J

KNOWLEDGE GUIDELINE FOR COMMUNITY PHARMACISTS

คู่มือชุดความรู้
สำหรับเภสัชกรชุมชนปฏิบัติงาน



Knowledge Guide
for Community Pharmacists


โรคเบาหวาน
Diabetes Mellitus
สาเหตุ
ร่างกายขาดอินซูลิน หรือ
ประสิทธิภาพการทำงานของอินซูลินลดลง
ร่างกายดึงน้ำตาลที่มีในเลือดไปใช้ไม่ได้
ส่งผลให้ระดับน้ำตาลในเลือดสูงขึ้น
อินซูลิน คืออะไร
สำคัญอย่างไร
• ฮอร์โมนทำหน้าที่ดึงน้ำตาลจากเลือดเข้าสู่เนื้อเยื่อ
ต่างๆ ของร่างกาย เพื่อสร้างพลังงาน
• สร้างและหลั่งจากเบต้าเซลล์ของตับอ่อน


โรคเบาหวาน
Diabetes Mellitus
หิวบ่อย
น้ำหนักลด
โดยไม่ทราบ
สาเหตุ
ตามัว
แผลหายช้า
ติดเชื้อทางเดิน
ปัสสาวะ หรือ
ผิวหนังบ่อยๆ
ปัสสาวะ
บ่อย
อาการ
เกณฑ์การควบคุมระดับน้ำตาลในเลือด
การตอจอด
ปกติ
Pre – diabetic
เบาหวาน
อดอาหาร 8 ชั่วโมง (mg/dl)
80–100
101–126
> 126
หลังทานอาหาร (mg/dl)
< 200
-
≥ 200
Oral glucose tolerance test (mg/dl)
< 140
141–199
≥ 140
น้ำตาลสะสมนาน 3 เดือน (HbA1c) (%)
< 7%
ที่มา : ADA guideline 2009

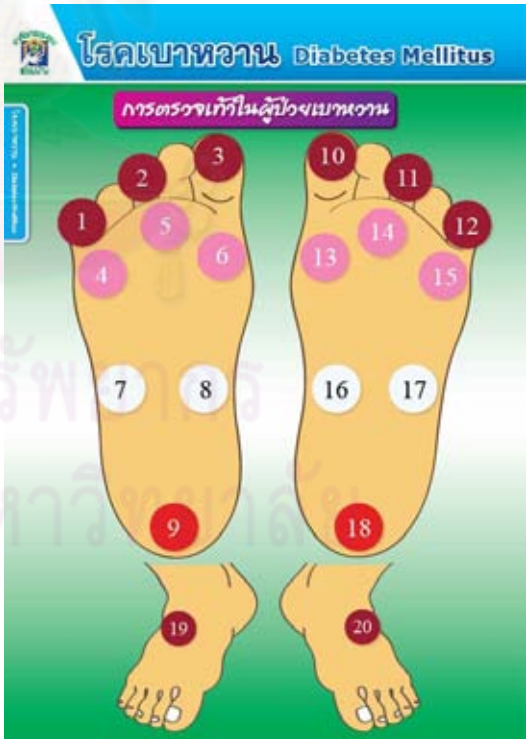

โรคเบาหวาน
Diabetes Mellitus
การรักษาโรคเบาหวาน
พฤติกรรม
ยา
อาหาร
ยาก่อนอาหาร
ก่อนอาหาร 15-30 นาที
ไม่กินอาหารภายใน 30 นาที - 1 ชั่วโมง
ยาไม่ได้ผล,
น้ำตาลต่ำ
ยาหลังอาหาร
หลังอาหาร 15- 30 นาที
เมื่อกินยาแล้วไม่สามารถคุม
ระดับน้ำตาลได้, ภาวะโรคไต
ยาฉีด


โรคเบาหวาน
Diabetes Mellitus
สัญญาณเตือน
ภาวะน้ำตาลในเลือดต่ำ
มือสั่น
ใจสั่น
หน้ามืด
ปวดหัว
มึนงง
เกิดจาก
ไม่ได้กินอาหาร
กินแอลกอฮอล์มาก
ออกกำลังกายมากไป
เครียด
กินยาก่อนอาหารแล้วไม่กินอาหาร
หรือ ทิ้งช่วงกินอาหารนานเกินไป
แก้ไข
• ดื่มน้ำผลไม้ / น้ำหวานครึ่งแก้ว /
อมลูกกวาด
• อาการไม่ดีขึ้นใน 10-15 นาที ทำซ้ำได้


โรคเบาหวาน
Diabetes Mellitus
การดูแลตัวเองเบื้องต้น เมื่อเป็นโรคเบาหวาน
วัดระดับน้ำตาลในเลือด
อย่างสม่ำเสมอ และควบคุม
ให้อยู่ในเกณฑ์ปกติ


โรคเบาหวาน
Diabetes Mellitus
ภาวะแทรกซ้อนระยะยาวจากโรคเบาหวาน
โรคหลอดเลือดสมอง
(Stroke)
ภาวะปลายประสาทเสื่อม
จากเบาหวาน
(Diabetic neuropathy)
โรคหลอดเลือดส่วนปลายตีบตัน
(peripheral arterial disease, PAD)
เบาหวานขึ้นตา
(Diabetic retinopathy)
ภาวะหลอดเลือดแดงแข็ง
(Atherosclerosis)
โรคหลอดเลือดหัวใจ
(Coronary artery disease)
โรคไตจากเบาหวาน
(Diabetic nephropathy)
เสื่อมสมรรถภาพทางเพศ
(Impotence)
แผลเบื่อยที่เท้า
(Diabetic foot ulcer)


โรคเบาหวาน
Diabetes Mellitus
การดูแลเท้าในผู้ป่วยเบาหวาน
เบาหวาน
เลือดหมุนเวียนไปปลายเท้าลดลง
แผลหายช้า/ลุกลาม ติดเชื้อที่รุนแรง
ปลายเท้าชาจากปลายประสาทอักเสบ ไม่รู้ตัวว่าเกิดแผลขึ้นแล้ว
ควรตรวจหาความผิดปกติของเท้าทุกวันและดูแลไม่ให้เกิดแผล
จุดที่ต้องตรวจตราเป็นพิเศษ
ใต้ฝ่าเท้าที่ต้องรองรับแรงกดจากน้ำหนักตัว (สีเทา) เป็นบริเวณที่มักเกิดปัญหาได้บ่อย
เลือกถุงเท้าและรองเท้า
เลือกซื้อรองเท้าที่คุณรู้สึกสวมสบายเมื่อแรกใส่ และใส่รองเท้าให้นานขึ้นในแต่ละวันเพื่อให้เคยชินกับรองเท้าใหม่


โรคเบาหวาน Diabetes Mellitus
การตรวจเท้าในผู้ป่วยเบาหวาน
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โรคความดันโลหิตสูง
(Hypertension)
ความดันเท่าไหร่...จึงเรียกว่าความดันโลหิตสูง ?
ประเภทของความดันโลหิต
ความดันโลหิตค่าบน (มม.ปรอท)
ความดันโลหิตค่าล่าง (มม.ปรอท)
ปกติ
< 120
และ
< 80
ค่อนข้างสูง (เสี่ยงเป็นโรคความดันโลหิตสูง)
120 – 139
หรือ
80 – 89
สูงระดับที่ 1
140 – 159
หรือ
90 – 99
สูงระดับที่ 2
ตั้งแต่ 160 ขึ้นไป
หรือ
ตั้งแต่ 100 ขึ้นไป
1. ค่าบน (Systolic) = ค่าสูงสุดแสดงการบีบตัวของหัวใจ, เลือดออกจากหัวใจ
2. ค่าล่าง (Diastolic) = ค่าต่ำสุดแสดงการขยายตัวของหัวใจ
(ความยืดหยุ่นของหลอดเลือด)


โรคความดันโลหิตสูง
(Hypertension)
หลักในการวัดความดันโลหิต
(1) ไม่ทำกิจกรรมที่ต้องใช้พลังงานมากก่อนควรวัดความดันโลหิตอย่างน้อย 2 ชั่วโมง เช่น การออกกำลังกาย
(2) ไม่ดื่มชา กาแฟ หรือเครื่องดื่มอื่นๆ ที่ผสมคาเฟอีน บุหรี่ หรือ สูบบุหรี่ ก่อนทำการวัดความดันโลหิต 2 ชั่วโมง
(3) ก่อนวัด นั่งพักอย่างน้อย 5 นาที โดยนั่งหลังพิงพนัก และเท้าทั้ง 2 ข้างวางราบกับพื้น วางพักแขนบนโต๊ะที่ระดับหัวใจ
(4) ไม่ควรพูดคุยในขณะที่ทำการวัดความดันโลหิต


โรคความดันโลหิตสูง
(Hypertension)
การปรับพฤติกรรมสำหรับผู้ป่วยความดันโลหิตสูง
ลดน้ำหนัก
งดสูบบุหรี่
งด/ลดแอลกอฮอล์
ออกกำลังกายสม่ำเสมอ
เลี่ยงอาหารเค็ม


หัวใจและหลอดเลือดแดงโคโรนารี
(Cardiac and Coronary Artery)
หัวใจ มีทั้งหมด 4 ห้อง ผนังของกล้ามเนื้อหัวใจจะแข็งแรงมาก หัวใจจึงสามารถบีบ – คลายตัว สูบฉีดเลือดไปเลี้ยงร่างกายได้ โดยไม่ต้องหยุดพัก
ไปทั่วร่างกาย หัวใจสูบฉีดเลือดไปทั่วร่างกาย เพื่อนำส่งออกซิเจนและสารอาหารไปเลี้ยงอวัยวะ
ไปยังหัวใจ หลอดเลือดของโคโรนารี ส่งเลือดที่มีออกซิเจนและสารอาหารไปเลี้ยงตัวหัวใจเอง
หัวใจ ต้องการออกซิเจนเช่นเดียวกับอวัยวะอื่น ๆ จึงมีหลอดเลือดที่มาเลี้ยงหัวใจด้วยเช่นกัน ชื่อว่า หลอดเลือดแดงโคโรนารี หากหลอดเลือดนี้ตีบลงจะส่งผลต่อหัวใจ
หลอดเลือดแดงโคโรนารีปกติจะยืดหยุ่นดี ผนังด้านในเรียบให้เลือดไหลผ่านได้สะดวก
หลอดเลือดแดงใหญ่ เอออร์ตา
หลอดเลือดแดงโคโรนารีด้านซ้าย
หลอดเลือดแดงโคโรนารีด้านขวา
เส้นประสาท
กล้ามเนื้อ
เยื่อหุ้มหัวใจ
หลอดเลือดดำ


ภาวะหลอดเลือดแดงแข็ง
(Atherosclerosis)
โรคหลอดเลือดแดงแข็ง หมายถึงอะไร ?
หมายถึง ภาวะหลอดเลือดแดงแข็ง ผนังหลอดเลือดแดงจะหนาขึ้น และสูญเสียความยืดหยุ่น
โรคหลอดเลือดแดงแข็ง เกิดขึ้นได้อย่างไร ?
A : ผนังของหลอดเลือดแดง ชอกช้ำจากการถูกทำลาย
B : ไขมันและคอเลสเตอรอล ก่อตัวขึ้นเป็นก้อนไขมัน
C : ก้อนไขมันสะสมตัวหนาขึ้น ทำให้ช่องว่างในหลอดเลือดแคบลง และขัดขวางการไหลเวียนของเลือด
เกิดภาวะแทรกซ้อนอะไรบ้าง?
1. กล้ามเนื้อหัวใจขาดเลือด
2. หัวใจวายฉับพลัน
3. หัวใจล้มเหลว
4. หลอดเลือดในสมองตีบ
5. หลอดเลือดแดงส่วนปลายตีบ

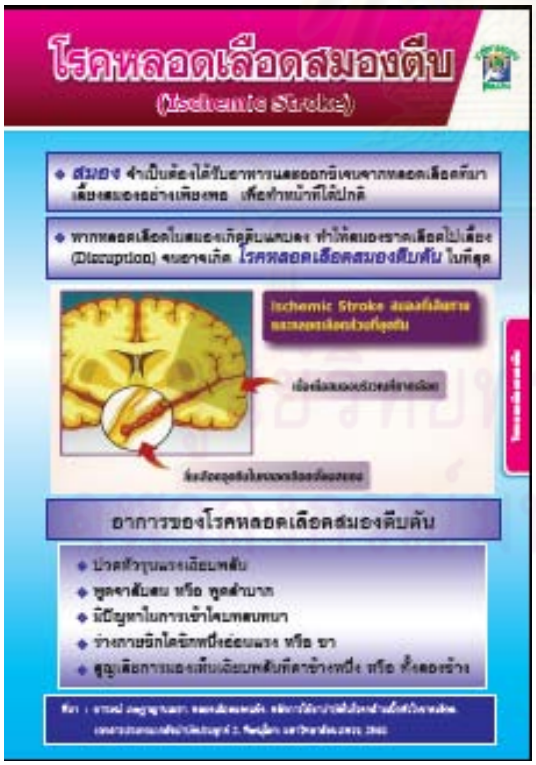

ภาวะหลอดเลือดแดงแข็ง
(Atherosclerosis)
ความเสี่ยงต่อการเกิดภาวะหลอดเลือดแดงแข็งจะเพิ่มขึ้นหากคุณ...
มีความดันโลหิตสูง (Hypertension)
มีระดับไขมันและคอเลสเตอรอลในเลือดสูง
เป็นโรคเบาหวาน (Diabetes Mellitus)
สูบบุหรี่จัด (Smoking)
ขาดการออกกำลังกาย
ความดันโลหิตสูง
มีระดับไขมันและคอเลสเตอรอลในเลือดสูง
ขาดการออกกำลังกาย
เป็นโรคเบาหวาน
สูบบุหรี่จัด


โรคกล้ามเนื้อหัวใจขาดเลือด
Ischemic Heart Disease (IHD)
โรคหัวใจขาดเลือด เกิดจากหลอดเลือดแดงที่มีหน้าที่ไปเลี้ยงหัวใจตีบ แคบลงจากก้อนไขมันที่สะสมในผนังของหลอดเลือด ทำให้หัวใจขาดเลือดและออกซิเจนไปเลี้ยง จนเกิดความเสียหาย
พลาก
กล้ามเนื้อหัวใจ
อาการเกิดเมื่อหัวใจทำงานหนัก โดยเฉพาะในขณะที่ตื่นเต้น หรือ ออกกำลังกาย ซึ่งกล้ามเนื้อหัวใจจะต้องการออกซิเจนเพิ่มขึ้น
อาการจะเกิดขึ้นชั่วคราว ปกติจะไม่เกิน 5 นาที
กล้ามเนื้อหัวใจ ไม่ถูกทำลายอย่างถาวร
อาการของโรคหัวใจขาดเลือด
เจ็บหน้าอกและอาจปวดร้าวไปตามแขน คอ หลัง หรือ ขากรรไกร
มีอาการขณะออกกำลังกาย หรือ ตื่นเต้น และ อาการดีขึ้นเมื่อได้พัก
เหงื่อออก คลื่นไส้ อาเจียน มึนงง

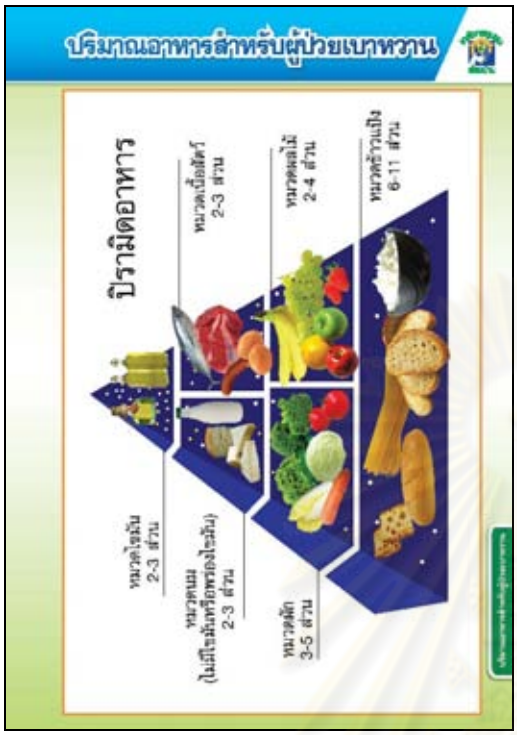

ภาวะหัวใจวายเฉียบพลัน
(Heart Attack)
ภาวะหัวใจวายเฉียบพลัน
เป็นภาวะที่เกิดจากการที่เส้นเลือดแดงโคโรนารีที่ไปเลี้ยงหัวใจเส้นใดเส้นหนึ่งหรือหลายเส้น เกิดการอุดตันเฉียบพลัน ทำให้กล้ามเนื้อหัวใจขาดออกซิเจนมาเลี้ยง จนกล้ามเนื้อหัวใจตาย
เส้นเลือด
พลาก
กล้ามเนื้อหัวใจ
อาการเตือนของภาวะหัวใจวายเฉียบพลัน
เจ็บหน้าอกและอาจปวดร้าวไปตามแขน คอ หลัง หรือขากรรไกร
อาการเจ็บหน้าอก นานเกินกว่า 15 นาที
หายใจลำบากคิดขัด หอบเหนื่อย ไม่มีแรง
เหงื่อออกท่วมตัว
คลื่นไส้ อาเจียน เวียนศีรษะ


ภาวะหัวใจวายเฉียบพลัน
(Heart Attack)
ผู้ที่เสี่ยงต่อการเกิดอาการกล้ามเนื้อหัวใจขาดเลือดเฉียบพลัน
มีภาวะไขมันในเลือดผิดปกติ และรับประทานอาหารที่มีไขมันสูง
ดูบุหรี่จัด
เป็นโรคความดันโลหิตสูง
เป็นโรคเบาหวาน
ขี้เกียจ และออกกำลังกายไม่สม่ำเสมอ
มีความเครียดบ่อย
ผู้ที่มีประวัติ คนในครอบครัวเป็นโรคหัวใจ
การลดความเสี่ยงต่อโรคหัวใจขาดเลือด
1. ลดพฤติกรรมเสี่ยง เช่น ลดบริโภคอาหารที่อุดมด้วยไขมัน โดยเฉพาะอย่างยิ่งไขมันชนิดอิ่มตัว
2. ลดน้ำหนักโดยการจำกัดอาหาร (ให้ลดลงประมาณ ~1 กิโลกรัม) โดย ผู้หญิง ให้รับประทานเพียงวันละ 1,200-1,500 แคลอรี ผู้ชาย ให้รับประทานเพียงวันละ 1,500-1,800 แคลอรี
3. ออกกำลังกายอย่างสม่ำเสมอ


โรคหลอดเลือดแดงส่วนปลายตีบ
(Peripheral Arterial Disease; PAD)
โรคหลอดเลือดแดงส่วนปลายตีบตัน เป็นภาวะที่หลอดเลือดแดงตามแขนขาตีบแคบลงหรืออุดตัน ส่งผลให้เนื้อเยื่อบริเวณนั้นขาดเลือด
มักพบบ่อยบริเวณขาและปลายเท้ามากกว่าบริเวณอื่นๆ
ขาและปลายเท้าแดงหลอดเลือดปกติแดงหลอดเลือดอุดตัน
มักพบบ่อยบริเวณขาและปลายเท้ามากกว่าบริเวณอื่นๆ
Stage 1: ปวดเล็กน้อยในขณะเดิน (Claudication)
Stage 2: ปวดมากแม้ว่าจะเดินในระยะสั้นๆ (Intermittent claudication)
Stage 3: ปวดแม้ในขณะพัก (Rest pain)
Stage 4: มีภาวะเนื้อเยื่อตาย (Gangrene)


โรคหลอดเลือดสมองตีบ
(Ischemic Stroke)
สมอง จำเป็นต้องได้รับอาหารและออกซิเจนจากหลอดเลือดตีบเลี้ยงสมองอย่างเพียงพอ เพื่อทำหน้าที่ได้ปกติ
หากหลอดเลือดในสมองเกิดตีบแคบลง ทำให้สมองขาดเลือดไปเลี้ยง (Disruption) จนอาจเกิด โรคหลอดเลือดสมองตีบตัน ในที่สุด
Ischemic Stroke สมองขาดเลือดและออกซิเจนส่วนที่อุดตัน
อาการของโรคหลอดเลือดสมองตีบตัน
ปวดศีรษะรุนแรงเฉียบพลัน
พูดจาสับสน หรือ พูดลำบาก
มีปัญหาในการเข้าใจบทสนทนา
ร่างกายซีกใดซีกหนึ่งอ่อนแรง หรือ ชา
สูญเสียการมองเห็นเฉียบพลันที่ตาข้างหนึ่ง หรือ ทั้งสองข้าง


ภาวะหัวใจล้มเหลว
(Heart Failure)
ภาวะหัวใจล้มเหลว คือ ภาวะที่หัวใจไม่สามารถสูบฉีดเลือดไปเลี้ยงส่วนต่างๆ ของร่างกายได้อย่างเพียงพอ
เกิดได้หลายสาเหตุ เช่น โรคหัวใจขาดเลือด ภาวะหัวใจวายเฉียบพลัน ซึ่งทำให้กล้ามเนื้อหัวใจบางส่วนถูกทำลาย หัวใจมีแรงบีบตัวลดลงเรื่อยๆ จนไม่สามารถบีบตัวได้ตามเดิม
อาการของภาวะหัวใจล้มเหลว
เหนื่อยง่าย แน่นหน้าอก หายใจลำบาก
ไอมีเสมหะ หรือ ไอมีเลือดปนเรื้อรัง
ขาบวมน้ำ
สับสน ความจำลดลง
ใจสั่น (หัวใจเต้นเร็วแต่อ่อน)


ปริมาณอาหารสำหรับผู้ป่วยเบาหวาน
ปิรามิดอาหาร
หมวดข้าวแป้ง 6-11 ส่วน
หมวดผลไม้ 2-4 ส่วน
หมวดเนื้อสัตว์ 2-3 ส่วน
หมวดไขมัน 2-3 ส่วน
หมวดนม (ไม่มีไขมันหรือพร่องไขมัน) 2-3 ส่วน
หมวดผัก 3-5 ส่วน

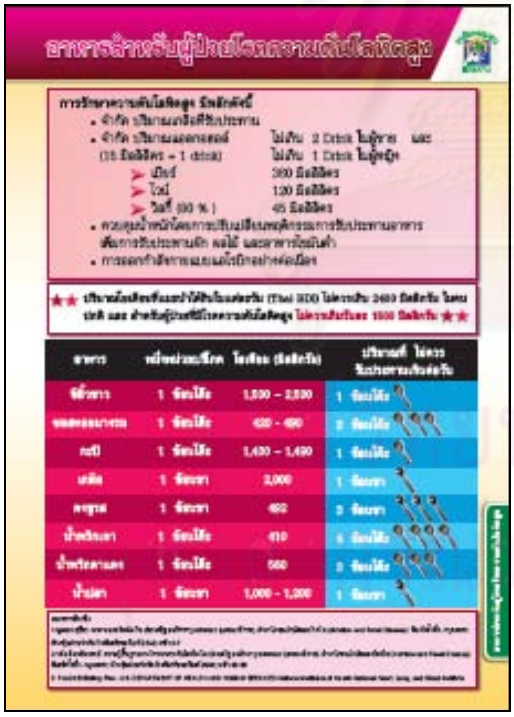

ปริมาณอาหารสำหรับผู้ป่วยเบาหวาน
หมวดที่ 1 : นม
นมสด
นมพร่องไขมัน
หมวดที่ 2 : ไขมัน
ไขมันเพียว
น้ำมันพืช
= 1 ช้อนชา
เนย, มาการีน
= 1 ช้อนชา
กะทิ
= 1 ช้อนโต๊ะ
ครีม
= 1 ช้อนโต๊ะ


ปริมาณอาหารสำหรับผู้ป่วยเบาหวาน
หมวดที่ 3 : เนื้อสัตว์
เนื้อสัตว์ไขมันต่ำ
เนื้อสัตว์ไขมันปานกลาง
เนื้อสัตว์ไขมันสูง


ปริมาณอาหารสำหรับผู้ป่วยเบาหวาน
หมวดที่ 4 : ข้าว และ แป้ง
ข้าว และ แป้ง
ข้าวสุก
= 65 กรัม
= 1 ทัพพี
= 1/3 ถ้วยตวง
ข้าวโพด
= 1/2 ฝัก
ขนมปังปอนด์
= 1 แผ่นใหญ่
= 30 กรัม
เส้นก๋วยเตี๋ยวสุก
= 1 ทัพพี
= 1/3 ถ้วยตวง
ก๋วยเตี๋ยว
= 70 กรัม
= 1 ทัพพี
= 1/3 ถ้วยตวง
เมล็ดธัญพืช
= 1 ทัพพี
= 1/3 ถ้วยตวง
ขนมจีน
= 110 กรัม
= 1 ทัพพี
= 1/3 ถ้วยตวง
เส้นสปาเกตตี
= 1 ทัพพี
= 1/3 ถ้วยตวง
ข้าวเหนียวนึ่ง
= 3 ช้อนโต๊ะ
= 1/4 ถ้วยตวง
มะพร้าว
= 1 ก้อน
= 3/4 ถ้วยตวง
มะพร้าวสำเร็จรูป
= 1/2 ก้อน
มะกะโรนี
= 1 ทัพพี
= 1/3 ถ้วยตวง
สปาเก็ตตี้
= 1 ทัพพี
= 1/3 ถ้วยตวง
วุ้นเส้นสุก
= 1 ทัพพี
= 1/3 ถ้วยตวง

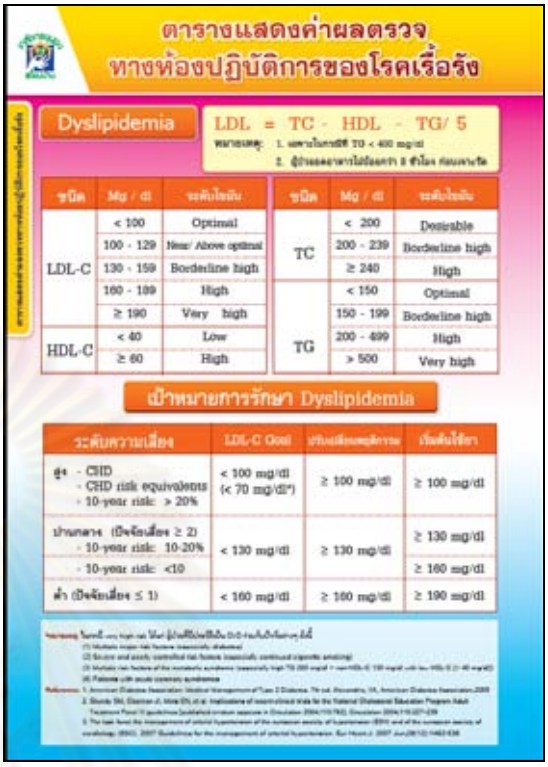

ปริมาณอาหารสำหรับผู้ป่วยเบาหวาน
หมวดที่ ๕ : ผลไม้
ผลไม้ 1 ส่วนมีคาร์โบไฮเดรต 10 กรัม พลังงาน 40 กิโลแคลอรี
กล้วยน้ำว้าดิบ
1 ผลเล็ก = 40 กรัม
ทุเรียน
2 คำ = 50 กรัม
สับปะรด
8 คำ = 60 กรัม
องุ่น
10-12 ผล = 60 กรัม
ส้มเขียวหวาน
1 ผลกลาง = 160 กรัม
เงาะ
1-2 ผล = 65 กรัม
มะละกอสุก
8-10 ชิ้นคำ = 90 กรัม
ละมุด
1-2 ผล = 50 กรัม
ลิ้นจี่
6-8 ชิ้นคำ = 65 กรัม
มังคุด
1-2 ผล = 70 กรัม
แตงโม
8-8 ชิ้นคำ = 75 กรัม
ลางสาด
5-6 ผล = 60 กรัม
มะม่วง
1/2-1 ผล = 65 กรัม
สับปะรด
5-6 คำ = 80 กรัม
ฝรั่ง
1/2-1 ผล = 60 กรัม
แอปเปิ้ล
1-2 ผล = 65 กรัม

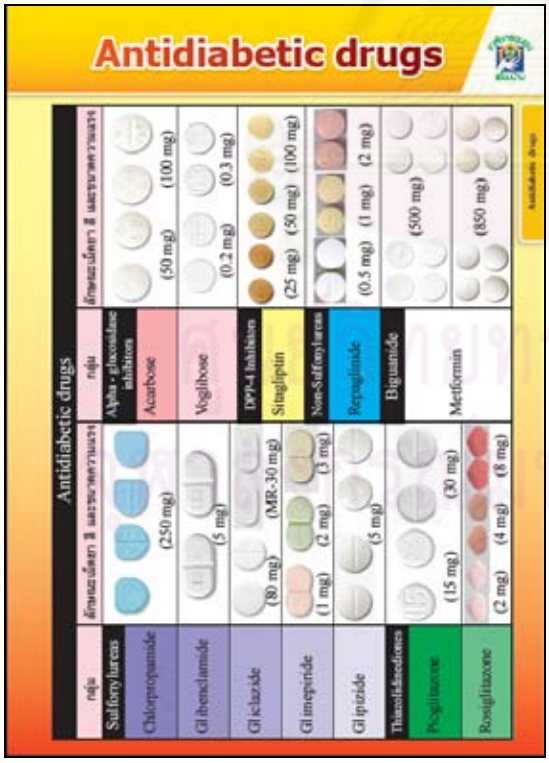

ปริมาณอาหารสำหรับผู้ป่วยเบาหวาน
หมวดที่ ๖ : ผัก
ประเภท ก.
ประเภท ข.
ผักสุก ครึ่ง ถ้วย
ผักสด 1 ถ้วย

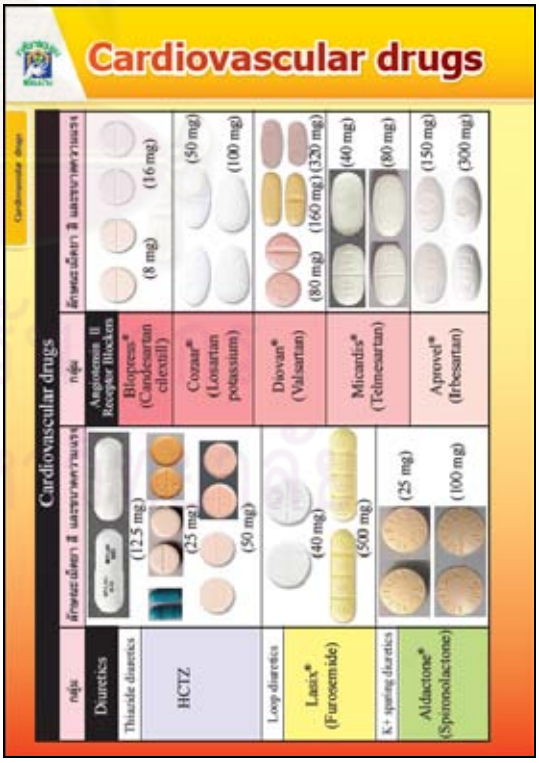

อาหารสำหรับผู้ป่วยโรคความดันโลหิตสูง
การรักษาความดันโลหิตสูง มีหลักดังนี้
ปริมาณโซเดียมที่แนะนำให้รับในแต่ละวัน (Thai RDI) ไม่ควรเกิน 2400 มิลลิกรัม โดยเฉพาะ และ สำหรับผู้ป่วยที่มีโรคความดันโลหิตสูง ไม่ควรเกินวันละ 1500 มิลลิกรัม
อาหาร
หน่วยแลกเปลี่ยน
โซเดียม (มิลลิกรัม)
ปริมาณที่ ไม่ควรรับประทานเกินต่อวัน
ข้าวสาร
ขนมจีนอบแห้ง
กะปิ
เกลือ
ลูกชิ้น
น้ำพริกเผา
น้ำพริกลงเรือ
น้ำปลา

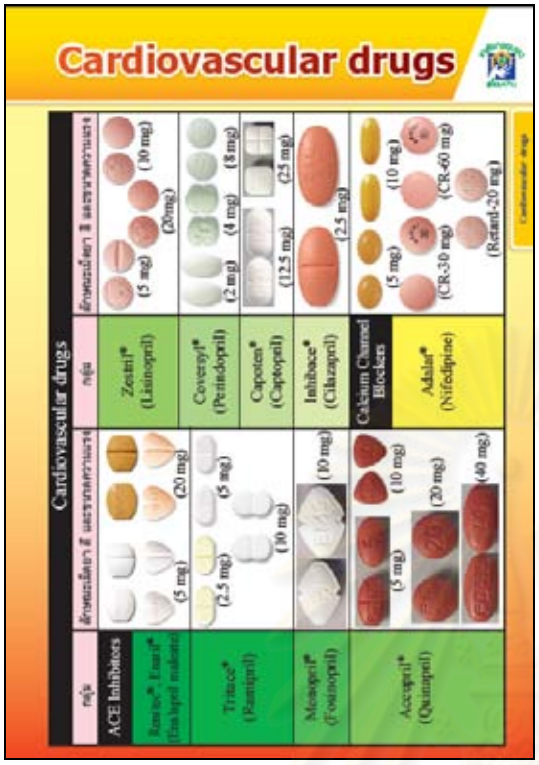

อาหารที่ผู้ป่วยโรคนิ่วในถุงน้ำดีควรหลีกเลี่ยง
โรคนิ่วในถุงน้ำดี
สาเหตุของโรคนิ่วในถุงน้ำดี
จำนวนครั้งที่รับประทานอาหาร
อาหารที่มีไขมันต่ำ น้อย : 0 – 50 มิลลิกรัม/ อาหาร 100 กรัม
นม ไข่ ผลไม้ทุกชนิด น้ำตาล ไขมันจากพืช
รับประทานได้
อาหารที่มีไขมันต่ำ ปานกลาง : 50 – 100 มิลลิกรัม/ อาหาร 100 กรัม
เนื้อหมู วัว และ แกะ เนื้อสัตว์ปีก กุ้ง ปู หอย ปลา ทุกชนิด นานๆ
ควรรับประทาน ปริมาณน้อยๆ หรือ ไม่ควรรับประทาน
อาหารที่มีไขมันต่ำ สูง : 150 – 825 มิลลิกรัม/ อาหาร 100 กรัม
กะปิ หน่อไม้ดิบ ผัก ปลาทำให้แห้งกระป๋อง ตับ น้ำมัน ไข่ปลา ผักดอง ข้าวโอ๊ต
ผู้ป่วยไม่ควร รับประทานเลย

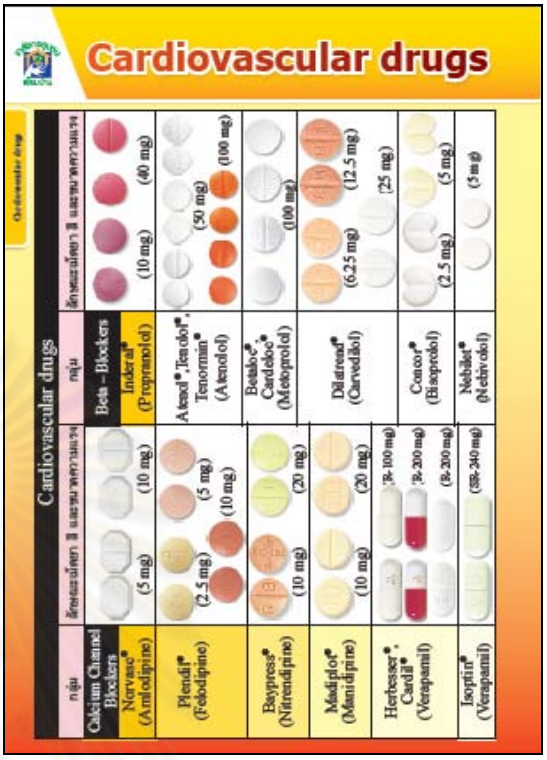

ตารางแสดงค่าผลตรวจ
ทางห้องปฏิบัติการของโรคเรื้อรัง
Diabetes Mellitus
การวินิจฉัย
ระดับน้ำตาลในเลือด
อดอาหาร 8 ชั่วโมง (FPG)
> 126 mg/ dl
Random plasma glucose
> 200 mg/ dl
Goal
ระดับน้ำตาลในเลือด
อดอาหาร 8 ชั่วโมง (FPG)
≤ 126 mg/ dl
หลังอาหาร 2 ชั่วโมง
≤ 180 mg/ dl
HbA1C
≤ 7.0 %
Hypertension
Major risk factor for CHD


ตารางแสดงค่าผลตรวจ
ทางห้องปฏิบัติการของโรคเรื้อรัง
Dyslipidemia
LDL = TC - HDL - TG/ 5
เป้าหมายการรักษา Dyslipidemia

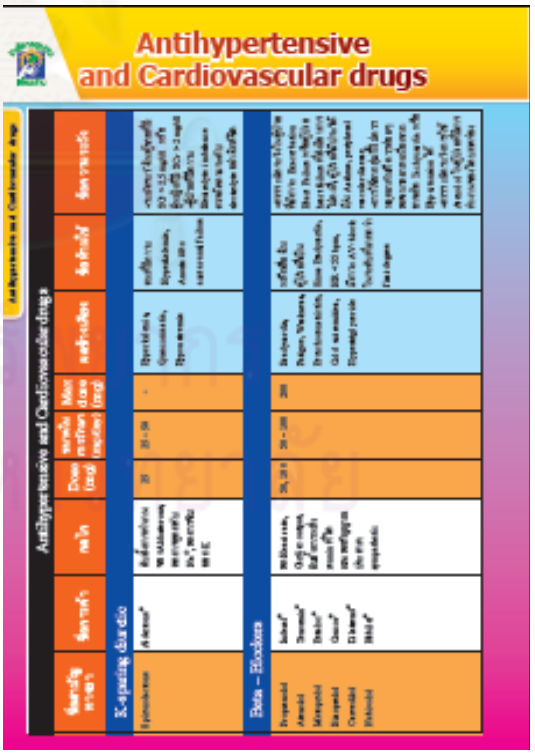

Antidiabetic drugs
Sulfonylureas
Chlorpropamide
Glibenclamide
Gliclazide
Glimepiride
Glipizide
Thiazolidinediones
Pioglitazone
Rosiglitazone
Alpha-glucosidase inhibitors
Acarbose
Voglibose
DPP-4 Inhibitors
Sitagliptin
Non-Sulfonylureas
Repaglinide
Biguanide
Metformin


Cardiovascular drugs
Angiotensin II Receptor Blockers
Blopress* (Candesartan cilexetil)
Cozaar* (Losartan potassium)
Diovan* (Valsartan)
Micardis* (Telmesartan)
Aprovel* (Irbesartan)
Diuretics
Thiazide diuretics
HCTZ
Loop diuretics
Lasix* (Furosemide)
K+ sparing diuretics
Aldactone* (Spironolactone)


Cardiovascular drugs
ACE Inhibitors
Renitec® (Enalapril maleate)
Tritace® (Ramipril)
Monopril® (Fosinopril)
Accupril® (Quinapril)
Zestril® (Lisinopril)
Ceveryl® (Perindopril)
Capoten® (Captopril)
Inhibace® (Cilazapril)
Calcium Channel Blockers
Adalat® (Nifedipine)


Cardiovascular drugs
Calcium Channel Blockers
Norvasc® (Amlodipine)
Plendil® (Felodipine)
Beta – Blockers
Inderal® (Propranolol)
Atenol®, Tenolol®, Tenormin® (Atenolol)
Betaloc®, Cardelobe® (Metoprolol)
Dilatrend® (Carvedilol)
Concor® (Bisoprolol)
Nebilet® (Nebivolol)


Antihypertensive and Cardiovascular drugs

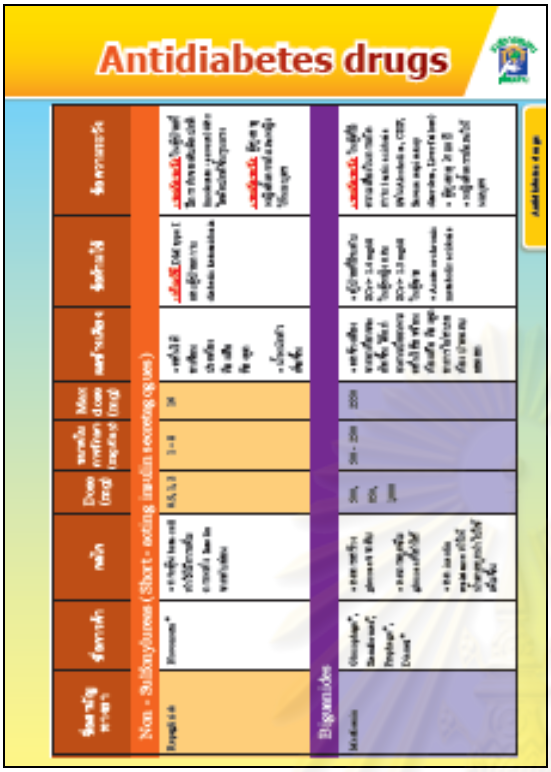

Antihypertensive and Cardiovascular drugs

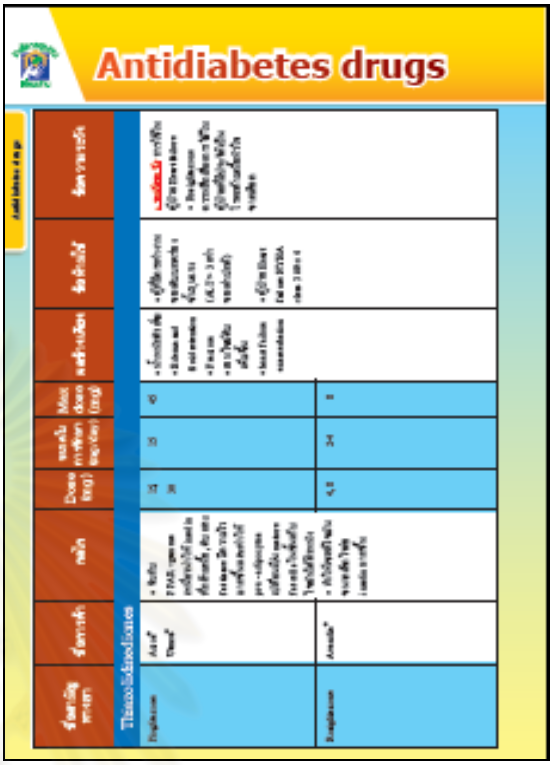
Antihypertensive and Cardiovascular drugs

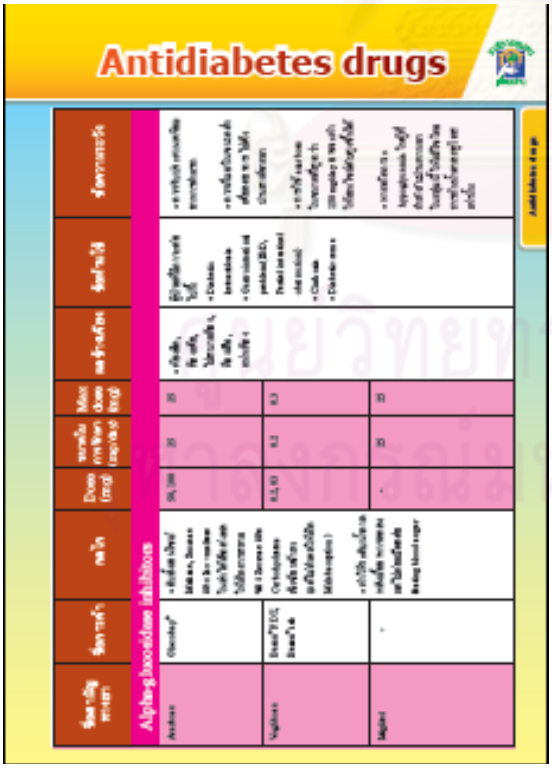
Antihypertensive and Cardiovascular drugs

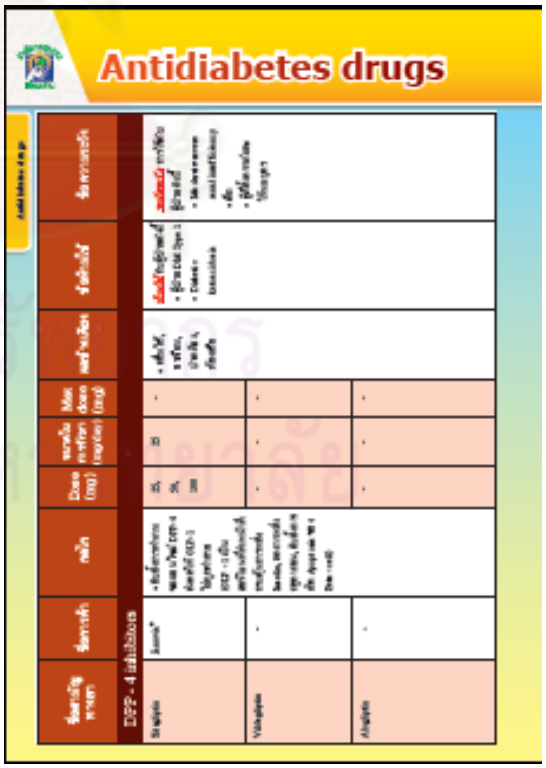
Antihypertensive and Cardiovascular drugs

Antidiabetes drugs


Antidiabetes drugs
Non - Sulfonylureas (Short - acting insulin secretagogues)
Biguanides


Antidiabetes drugs
Thiazolidinediones


Antidiabetes drugs
Alpha-glucosidase inhibitors


Antidiabetes drugs
DPP - 4 inhibitors

APPENDIX K

CONSENT FORM
AND
INFORMATION SHEET

APPENDIX XI: CONSENT FORM (ENGLISH)

Informed Consent Form

At……

Date……. Month……Year……

Patient Number □□□□□-□□□□□-□□□

Application consent to participate by voluntarily

The research: Effectiveness of Pharmacist Home Health Care for Type 2 Diabetes in Bangkok Metropolitan: A Community Based Study

Research: Sirirat Tunpichart
address: 1209 Soi Latphrao 94, Latphrao Rd., Wangthonglang, Bangkok 10310
Tel: 02-934-4874, 02-538-4906, 089-141-9371

Before signing this consent form to participate in this study, I have received information and explanation about the project. I understand all the purpose, procedures, perils, and possible benefits involving in the project. I have good understanding on the terms and conditions. In addition, all of my questions have been answered to my satisfaction.

I agree voluntarily to talk in person, allow pharmacists to visit my house, and give some important information on the phone for five times a month, approximately 30-60 minutes for each visit. I will also do the questionnaires related to the project for the duration of six months. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my medical care or legal rights being affected.

I realize that many people will handle my personal health information collected for this study. The study team will make every effort to protect the information and keep it confidential. All kind of information being collected, it will never be used in a way that could identify or embarrass me.

If I am treated wrongly or harmed as a direct result of being in the study, I will be taken care of by doctors, nurses and pharmacists under the supervision in hospital. If I have questions about my rights as a study participant, want to report any problems or complaints, obtain information about the study, or offer input, I can contact the pharmacist Mrs. Sirirat Tunpichart at 02-538-4906, 089-1419371 at any time.

I have read and understood the above, and give fully consent to participate:

Signatures:

Participants …… Date ……

The main researcher ……Date ……

Witness ……Date ……

I cannot read, though the researcher has read the agreement for me and I understood thoroughly. I voluntarily signed this agreement.

Signatures:

Participants …… Date ……

The main researcher ……Date ……

Witness ……Date ……

CONSENT FORM (THAI)

หนังสือแสดงความยินยอมเข้าร่วมการวิจัย

ทำที่.....

วันที่.....เดือน.....พ.ศ. .....

เลขที่ผู้ป่วย □□□□□-□□□□□-□□□

ข้าพเจ้า ซึ่งได้ลงนามท้ายหนังสือนี้ ขอแสดงความยินยอมเข้าร่วมโครงการวิจัย

ชื่อ โครงการวิจัย ประสิทธิผลของเภสัชกรเยี่ยมบ้านในการดูแลผู้ป่วยโรคเบาหวาน ประเภท 2 ในชุม ชน เขตกรุงเทพมหานคร

ชื่อผู้วิจัย ภญ.ศิริรัตน์ ตันปิชาติ ที่อยู่ที่ติดต่อ 1209 ซอยลาดพร้าว 94 ถนนลาดพร้าว แขวงวังทองหลาง เขตวังทองหลาง กทม. 10310 โทรศัพท์ 02-538-4906, 089-1419371

ข้าพเจ้า ได้รับทราบรายละเอียดเกี่ยวกับที่มาและวัตถุประสงค์ในการทำวิจัย รายละเอียดขั้นตอนต่างๆ ที่จะต้องปฏิบัติหรือได้รับการปฏิบัติ ความเสี่ยง/อันตราย และประโยชน์ซึ่งจะเกิดขึ้นจากการวิจัยเรื่องนี้ โดยได้อ่านรายละเอียดในเอกสารชี้แจงผู้เข้าร่วมการวิจัยโดยตลอด และได้รับคำอธิบายจากผู้วิจัย จนเข้าใจเป็นอย่างดีแล้ว

ข้าพเจ้ายินดีสละเวลาพูดคุย ตอบแบบสอบถามอาการเจ็บป่วยและให้ข้อมูลเกี่ยวกับการรักษาและการใช้ยากับเภสัชกรที่เยี่ยมบ้าน และโทรศัพท์รวม 5 ครั้งๆละ 30-60 นาทีทุกเดือน รวมทั้งตอบแบบประเมิน ในระยะเวลา 6 เดือน ในการสอบถามข้อมูล ผู้วิจัยจะนำข้อมูลดังกล่าวประสานไปยังทีมพยาบาลเยี่ยมบ้าน และแพทย์ ของศูนย์บริการสาธารณสุข กทม. เพื่อเพิ่มประสิทธิภาพในการดูแลผู้ป่วยโรคเบาหวาน ประเภท 2 ในพื้นที่เขตกรุงเทพมหานคร

ข้าพเจ้ามีสิทธิถอนตัวออกจากการวิจัยเมื่อใดก็ได้ตามความประสงค์ โดยไม่ต้องแจ้งเหตุผล ซึ่งการถอนตัวออกจากการวิจัยนั้น จะไม่มีผลต่อการรักษาโรคในปัจจุบันของข้าพเจ้า

ข้าพเจ้าได้รับคำรับรองว่า ผู้วิจัยจะปฏิบัติต่อข้าพเจ้าตามข้อมูลที่ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัยและข้อมูลใดๆ ที่เกี่ยวข้องกับข้าพเจ้า ผู้วิจัยจะเก็บรักษาเป็นความลับ โดยจะนำเสนอข้อมูลการวิจัยเป็นภาพรวมเท่านั้น ไม่มีข้อมูลใดในการรายงานที่จะนำไปสู่การระบุตัวข้าพเจ้า

หากข้าพเจ้าไม่ได้รับการปฏิบัติตรงตามที่ได้ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย ข้าพเจ้าสามารถร้องเรียนได้ที่ คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย ชั้น 4 อาคารสถาบัน 2 ซอยจุฬาลงกรณ์ 62 ถนนพญาไท เขตปทุมวัน กรุงเทพฯ 10330 โทรศัพท์ 0-2218-8147 โทรสาร 0-2218-8147 E-mail: eccu@chula.ac.th

ข้าพเจ้าได้ลงลายมือชื่อไว้เป็นสำคัญต่อหน้าพยาน ทั้งนี้ข้าพเจ้าได้รับสำเนาเอกสารชี้แจงผู้เข้าร่วมการวิจัย และสำเนาหนังสือแสดงความยินยอมไว้แล้ว

ข้าพเจ้าได้อ่านข้อความข้างต้นแล้วและมีความเข้าใจดีทุกประการ จึงได้ลงนามในใบยินยอมด้วยความสมัครใจ

ลงนาม ..... *ผู้มีส่วนร่วมในการวิจัย* วันที่.....

ลงนาม ..... ผู้วิจัยหลัก วันที่.....

ลงนาม ..... พยาน วันที่.....

ข้าพเจ้าไม่สามารถอ่านหนังสือได้ แต่ผู้วิจัยได้อ่านข้อความในใบยินยอมนี้ให้แก่ข้าพเจ้าฟังจนเข้าใจดีแล้วข้าพเจ้าจึงได้ลงนามในใบยินยอมนี้ด้วยความสมัครใจ

ลงนาม ..... *ผู้มีส่วนร่วมในการวิจัย* วันที่.....

ลงนาม .....ผู้วิจัยหลัก วันที่.....

ลงนาม .....พยาน วันที่.....

INFORMATION SHEET (ENGLISH)

Participant Information Sheet

The research: Effectiveness of Pharmacist Home Health Care for Type 2 Diabetes in Bangkok Metropolitan: A Community Based Study

Researcher: Sirirat Tunpichart

Coordinating centre: 1209 Soi Latphrao 94, Latphrao Rd., Wangthonglang, Bangkok 10310

Tel: 02-934-4874, 02-538-4906, 089-141-9371

E-mail: s_tunpichart@yahoo.com

1. You are invited to take part in this research study. It is significant to know why this research study is being done, what will happen in the research study, possible risks and benefits to you, your choices, and other important information. If there is anything that you do not understand, please ask questions. Then you can decide if you want to join this study or not.
2. This research is on an area of effectiveness of pharmacist home health care for type 2 diabetes in Bangkok Metropolitan.
3. In this study we focus on ensuring safety medication usage and Type 2 Diabetes control in Bangkok Metropolitan by cooperation with multidisciplinary team, *we aim to help patients on having proper treatments*.
4. All 285 eligible participants in this research study are Type 2 Diabetics, living in the research areas in Bangkok Metropolitan, who have been in treatments, but have not been able to control blood glucose level for at least three months. These participants are selected by nurses at Public Health Centre in Bangkok Metropolitan. (In the case of young participants, aged lower than eighteen, permission from parents must be submitted in a written form).
5. To do this research study, pharmacists need a permission to collect and use some of your health information. This information may come from questions about medication and its usage which we ask whilst visiting, or forms you are asked to fill out. The contact will be made in person for four times and once via a telephone call which might take around 30-60 minutes within six months.
6. The study team will collaborate closely with pharmacists, nurses and doctors in order to give the best care of your medication and its usage.
7. Since there might be some inconveniences such as giving your medical information, or being visited by pharmacists, you can cease the study at any time.
8. This study is mainly for giving efficient treatments to Type 2 Diabetics, and further benefits from the study are that:

8.1 You will be consulted by pharmacists on how to take your medication properly, and other information about Diabetes
8.2 You will also be given a health and personal booklet, which contains all the information about Diabetes, and its medication.
8.3 You will receive a medicine case to help you on taking your medication.

9. You can inquire about your questions and your rights as a study participant by asking the study pharmacists or directly contact the Sirirat Tunpichart at any time. We will inform you about further useful information related to the project at once.
10. You are free to withdraw at any time, without giving any reason, without your medical care or legal rights being affected.
11. The information that we collect from this research project will be kept confidential. Information about you that will be collected during the research will be put away and no-one but the researchers will be able to see it. Your name will be removed before being used in the study. The collected information will never be used in a way that could identify or embarrass you.
12. Your complaints over your rights abuses related to the study can be sent to:
Office of Ethical Review Committee for Research Involving Human Research Subjects, Health Science Group
4th Fl, Institute Building 2, Soi Chulalongkorn 62, Phyathai Rd., Pathumwan, Bangkok 10330, Thailand
Tel : 0-2218-8147, Fax : 0-2218-8147, E-mail : eccu@chula.ac.th

I would like to appreciate to thank you for your cooperation

Sirirat Tunpichart

(Research)

INFORMATION SHEET (THAI)

ข้อมูลสำหรับกลุ่มประชากรหรือผู้มีส่วนร่วมในการวิจัย

ชื่อโครงการวิจัย ประสิทธิผลของเภสัชกรเยี่ยมบ้านในการดูแลผู้ป่วยโรคเบาหวาน ประเภท 2 ในชุมชน เขตกรุงเทพมหานคร

ชื่อผู้วิจัย ภญ. ศิริรัตน์ ตันปิชาติ
ศูนย์ประสานงานโครงการ: 1209 ซอยลาดพร้าว 94 ถ.ลาดพร้าว เขตวังทองหลาง กทม. 10310
โทร: 02-9344874. 02-538 4906 มือถือ 089-141 9371 E-mail: s_tunpichart@yahoo.com

1. ขอเรียนเชิญท่านเข้าร่วมในการวิจัย ก่อนที่ท่านจะตัดสินใจเข้าร่วมในการวิจัย มีความจำเป็นที่ท่านควรทำความเข้าใจว่างานวิจัยนี้ทำเพราะเหตุใด และเกี่ยวข้องกับอะไร กรุณาใช้เวลาในการอ่านข้อมูลต่อไปนี้อย่างละเอียดรอบคอบ และสอบถามข้อมูลเพิ่มเติมหรือข้อมูลที่ไม่ชัดเจนได้ตลอดเวลา
2. โครงการนี้เกี่ยวข้องกับการวิจัยประสิทธิผลของเภสัชกรเยี่ยมบ้านในการดูแลผู้ป่วยโรคเบาหวาน ประเภท 2 ในชุมชน เขตกรุงเทพมหานคร
3. วัตถุประสงค์ของการวิจัยเพื่อสร้างความปลอดภัยเกี่ยวกับการใช้ยาและควบคุมอาการของโรค เบาหวาน ประเภท 2 ของผู้ป่วยในชุมชนเขตกรุงเทพมหานครโดยการปฏิบัติงานร่วมกับสหวิชาชีพ เพื่อมุ่งหวังให้ผู้ป่วยได้รับการรักษาอย่างเหมาะสม
4. ผู้มีส่วนร่วมในงานวิจัย คือ กลุ่มผู้ป่วยโรคเบาหวาน ประเภท 2 ที่อยู่ในภาวะการณ์ควบคุมระดับน้ำตาลเลือดไม่ได้และรับการรักษาพยาบาลอย่างต่อเนื่องอย่างน้อย 3 เดือน ในเขตกรุงเทพมหานคร จำนวน 285 คน ที่กระจายอยู่ตามพื้นที่ที่เข้าร่วมโครงการ โดยมีพยาบาลประจำศูนย์บริการสาธารณสุขกรุงเทพมหานครเป็นผู้ประสานงานการคัดเลือกผู้ป่วย (กรณีผู้ป่วยมีอายุน้อยกว่า 18 ปี ต้องข้อความยินยอมจากผู้ปกครอง)
5. กระบวนการวิจัย จะเป็นการสอบถามอาการเจ็บป่วย สังเกต ให้คำปรึกษาโดยเภสัชกรชุมชนเยี่ยมท่านที่บ้าน โดยท่านจะได้ตอบแบบประเมินด้วยตนเอง และเสียสละเวลาในการพูดคุยกับเภสัชกรที่ไปเยี่ยม โดยการให้ข้อมูลเกี่ยวกับการรักษาและการใช้ยาจำนวน 4 ครั้ง และทางโทรศัพท์ 1 ครั้ง ๆละ 30-60 นาที ในระยะเวลา 6 เดือน
6. ผู้วิจัยจะประสานกับทีมเภสัชกรเยี่ยมบ้าน แพทย์ และพยาบาลประจำศูนย์บริการสาธารณสุข กทม. เพื่อร่วมกันดูแลท่านด้านการใช้ยาอย่างสม่ำเสมอ
7. ความไม่สะดวกที่ผู้มีส่วนร่วมในการวิจัยอาจจะได้รับจากโครงการนี้ คือ ท่านต้องเสียเวลาหรือม่สบายใจในการพูดคุยตอบคำถามและให้ข้อมูลเกี่ยวกับผลการรักษาและการใช้ยากับเภสัชกรเยี่ยมบ้าน รวม 5 ครั้ง ๆ ละ 30-60 นาทีทุกเดือน ในช่วง 6 เดือน ทั้งนี้ท่านสามารถปฏิเสธการตอบคำถามได้ตลอดเวลา
8. ประโยชน์ที่จะได้รับจากโครงการผลจากการวิจัยจะช่วยเพิ่มประสิทธิภาพในการรักษาผู้ป่วยโรคเบาหวานประเภทที่ 2 เพิ่มขึ้น และ

8.1 ท่านจะได้รับคำปรึกษาจากเภสัชกรเกี่ยวกับหลักการใช้ยารักษาโรค,ความรู้เกี่ยวกับการใช้ยา, ความรู้เกี่ยวกับเรื่องโรค พร้อมแนวทางการรักษาและวิธีปฏิบัติตัวที่เหมาะสม

8.2 ท่านได้รับสมุดสุขภาพและการใช้ยาเฉพาะบุคคล จำนวน 1 เล่ม โดยมีเนื้อหาครอบคลุมข้อมูลเรื่องโรค การใช้ยา พร้อมแบบบันทึกข้อมูลด้านสุขภาพ ตารางบันทึกข้อมูลยา เป็นต้น

8.3 ท่านได้รับมอบกล่องใส่ยาเฉพาะราย จำนวน 1 กล่อง เพื่อส่งเสริมการดูแลตนเอง

9. *หากท่านมีข้อสงสัยให้สอบถามเพิ่มเติมสามารถติดต่อผู้วิจัยได้ตลอดเวลา* และหากผู้วิจัยมีข้อมูลเพิ่มเติมที่เป็นประโยชน์หรือโทษเกี่ยวกับการวิจัย ผู้วิจัยจะแจ้งให้ท่านทราบอย่างรวดเร็ว ท่านสามารถสอบถามข้อสงสัยที่เกี่ยวข้องกับโครงการได้จาก เภสัชกรเยี่ยมบ้านในพื้นที่ของท่านหรือศูนย์บริการสาธารณสุข และภญ. ศิริรัตน์ ตันปิชาติ ผู้ประสานงานโครงการ

10. ท่านสามารถปฏิเสธการเข้าร่วมหรือถอนตัวจากการวิจัยได้ตลอดเวลา โดยไม่ต้องให้เหตุผลและไม่สูญเสียประโยชน์ที่พึงได้รับและไม่มีผลกระทบต่อการดูแลรักษา

11. ข้อมูลที่เกี่ยวข้องกับท่านจะถูกเก็บเป็นความลับรายงานวิจัยจะนำเสนอในรูปที่เป็นผลสรุปโครงการเพื่อประโยชน์ทางวิชาการเท่านั้น

12. หากท่านไม่ได้รับการปฏิบัติตามข้อมูลดังกล่าวสามารถร้องเรียนได้ที่
คณะกรรมการพิจารณาจริยธรรมการวิจัยในคน กลุ่มสหสถาบัน ชุดที่ 1 จุฬาลงกรณ์มหาวิทยาลัย
ชั้น 4 อาคารสถาบัน 2 ซอยจุฬาลงกรณ์ 62 ถนนพญาไท เขตปทุมวัน กรุงเทพฯ 10330
โทรศัพท์ 0-2218-8147 โทรสาร 0-2218-8147 E-mail: eccu@chula.ac.th

ขอขอบคุณในความร่วมมือของท่านมา ณ ที่นี้
ภญ. ศิริรัตน์ ตันปิชาติ
(ผู้ประสานงานโครงการฯ)

BIOGRAPHY

Name: Sirirat Tunpichart

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Education:

1985- 1988	Bachelor of Science (Pharmacy), Faculty of pharmacy, Centro Escolar University, Philippines.
1997-1999	Master of Business Administration, Faculty of Graduate School, Sripatum University, Thailand

Professional experiences:

1989-1994	Sale Representative, Hoechst Thai Ltd.
1994- 2001	Product Manager, Aventis Pharma Ltd.
2003-2009	Staff of Faculty of Pharmacy, Huachiew Chalermprakiet University, Thailand
2001-Present	Pharmacy ownership, Kanok Pharma Chain, Bangkok, Thailand
2003-Present	Committee of Community Pharmacy Association (Thailand)

2006	Book Launch: “How to Run a Drugstore Business; A guide book for pharmacy business”
2008- Present	Project Manager: “Drug-related problems management for individual patient: Community-based in Bangkok Metropolitan” funding by National Health Security Organization Bangkok (NHSO)
2010	To perform the Good Pharmacy Practice and Pharmacy Practice Guideline
2010	Book launch: “Community Pharmacist Home health care Practice”