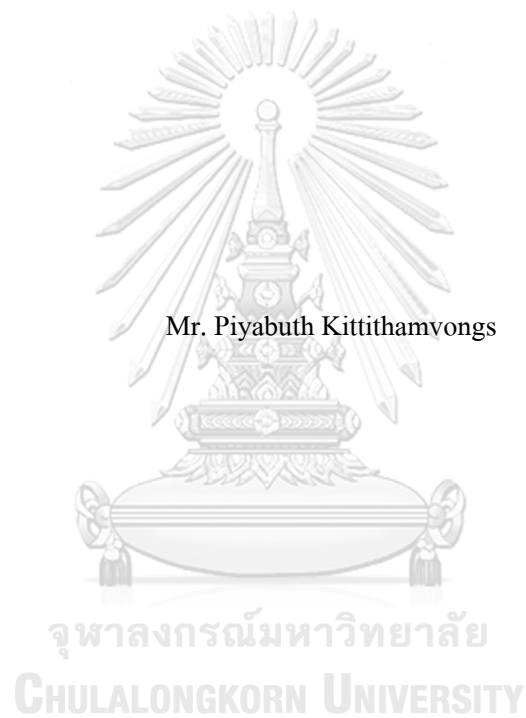Prescription of anti-osteoporosis medication among orthopedic surgeon (PAM-OS study) in
Osteoporotic Hip Fracture

Mr. Piyabuth Kittithamvongs

จุฬาลงกรณ์มหาวิทยาลัย
CHULALONGKORN UNIVERSITY

A Thesis Submitted in Partial Fulfillment of the Requirements

for the Degree of Master of Science in Health Development

Common Course

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ความคิดเห็นของศัลยแพทย์ออร์โธปิดิกส์ต่อปัจจัยที่มีผลต่อการจ่ายยาต้านกระดูกพรุนในผู้ป่วยที่มี
กระดูกสะโพกหักจากภาวะกระดูกพรุน

นายปิยบุตร กิตติธรรมวงศ์

Thesis Title	Prescription of anti-osteoporosis medication among orthopedic surgeon (PAM-OS study) in Osteoporotic Hip Fracture
By	Mr. Piyabuth Kittithamvongs
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ปิยบุตร กิตติธรรมวงศ์ : ความคิดเห็นของศัลยแพทย์ออร์โธปิดิกส์ต่อปัจจัยที่มีผลต่อ
การจ่ายยาต้านกระดูกพรุนในผู้ป่วยที่มีกระดูกสะโพกหักจากภาวะกระดูกพรุน. (
Prescription of anti-osteoporosis medication among orthopedic surgeon (PAM-OS
study) in Osteoporotic Hip Fracture) อ.ที่ปรึกษาหลัก : ผศ. นพ.กฤษณ์ พงศ์
พิรุฬห์PhD

วัตถุประสงค์:แม้ว่ามีข้อแนะนำในการรักษาผู้ป่วยที่มีภาวะกระดูกสะโพกหักจากภาวะ
กระดูกพรุนโดยการใช้ยาต้านกระดูกพรุน แต่พบว่าอัตราการจ่ายนี้นั้นยังต่ำมาก การศึกษานี้
จัดทำขึ้นเพื่อหาปัจจัยที่ส่งผลต่อการจ่ายยาต้านกระดูกพรุนของศัลยแพทย์กระดูกและข้อ
วิธีการ:ผู้วิจัยจัดทำแบบสอบถามและส่งไปทางจดหมายอิเลกโทรนิกส์ ไปยังศัลยแพทย์กระดูก
และข้อในประเทศไทยแบบสุ่ม โดยสอบถามถึงความเห็นว่าแต่ละปัจจัยมีผลต่อการจ่ายยาต้าน
กระดูกพรุนหรือไม่ และถ้าไม่ได้จ่ายยาสาเหตุนั้นๆคืออะไร
ผลการศึกษา: มีผู้ตอบแบบสอบถามจำนวน 294 คน อายุ, เพศ, ประวัติการมีกระดูกหักมาก่อน
และผลการตรวจมวลกระดูก มีผลต่อการจ่ายยาต้านกระดูกพรุน และสิทธิ์การรักษาของผู้ป่วยก็มี
ส่วนในการจ่ายยานี้ด้วย ส่วนเหตุผลที่ทำให้แพทย์ไม่ได้จ่ายยานี้มากที่สุดคือเรื่องราคาของยา
ข้อสรุป:การที่ทราบถึงปัจจัยต่างๆ ที่ส่งผลต่อการจ่ายยาต้านกระดูกพรุน มีส่วนช่วยในการ
วางแผนเพื่อเพิ่มอัตราการจ่ายยา เพื่อให้การได้รักษาที่ดีขึ้นซึ่งจะลดความทุพลภาพหรืออัตราการ
เสียชีวิตของผู้ป่วยได้

จุฬาลงกรณ์มหาวิทยาลัย
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สาขาวิชา	การพัฒนาสุขภาพ	ลายมือชื่อนิสิต ....
ปีการศึกษา	2561	ลายมือชื่อ อ.ที่ปรึกษาหลัก ....

6074352830 : MAJOR HEALTH DEVELOPMENT

Piyabuth Kittithamvongs : Prescription of anti-osteoporosis medication among orthopedic surgeon (PAM-OS study) in Osteoporotic Hip Fracture. Advisor: Asst. Prof. Doctor KRIT PONGPIRUL, Ph.D.

Summary: As a medication for preventing osteoporotic fracture is recommended but scarcely prescribed, this study surveyed Thai orthopedic surgeons to explore key determinants of their prescription practices. In addition to a set of well-known determinants, the patient's health insurance status could also influence the prescription practice.Purpose: Although many guidelines suggest using anti-osteoporosis medications in patients who suffered from fragility hip fractures, low rate of prescription was encountered all over the world. In this study, we aimed to explore potential determinants affecting the prescription of anti-osteoporosis medications by orthopedic surgeons.Materials and methods:Online questionnaire survey was conducted among randomly selected orthopedic surgeons in Thailand. We inquired the factors associated with anti-osteoporosis medication prescription (likely to prescribe, unlikely to prescribe, or not influential). The reasons for not prescribing were also inquired.Results: Two hundred and ninety-four participants responded to the questionnaires. Age, gender, previous fragility fracture, and BMD results seemed to influence the medication prescription. Interestingly, the type of reimbursement was responded as an important factor. The leading reason for not prescribing the medication was due to the high cost of the treatment.Conclusions: Knowing the factors affecting the prescription of anti-osteoporosis medication is beneficial for strategic planning in order to increase the rate of prescription. The gap of treatment may be reduced, and the morbidity and mortality of the patients can be

Field of Study:	Health Development	Student's Signature ....
Academic Year:	2018	Advisor's Signature ....

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CHAPTER 1

INTRODUCTION

Osteoporosis is a disease representing low bone mass with microarchitectural change of bone tissue which results in a decrease in bone strength and may lead to fragility fracture. Primary osteoporosis is caused by various factors such as age, gender, diet, and exercise. In the present era, the world becomes an "Aging society", referring to a rapid increase in aging population over the world. The report from United Nations estimated the rate of 2%-3% increasing annually in the population aged 60 years or older. With this rate, in developed region is expected to increase from 264 million in 2009 to 416 million in 2050. Furthermore, in developing region the number is expected even more, from 473 million in 2009 to 1.6 billion in 2050 (1). From (1)this estimated aging population, osteoporosis and subsequent events from the disease would be a major problem around the world.

The four leading fragility fractures caused by osteoporosis are hip, spine, proximal humerus, and wrist. Among these common locations of fragility fractures, osteoporotic hip fracture has the most impact on quality of life. Mortality rate after hip fracture in the first month was 11.9%-21.8%(2), and 14%-58% at one year (3). Mortality risk will not return to the rate of normal population even after 10 years (4). In terms of quality of life, 40% of patients could not walk independently, 60% have difficulty in essential activities of daily living, and 27% require a nursing home (5). Regardless of site of the previous fracture, a meta-analysis reported a twofold increase in the risk of future fracture after the first fracture. When focusing on hip fracture, the risk of following fracture after prior hip fracture was even higher to 3.2 times (6). Evidence stated that previous hip fracture is one of the main risk factors for a second

hip fracture (7). The problem is that the second fracture results in a devastating outcome. The first-year mortality rate may increase from 15.9% in the first fracture to 24.1% in the second event (8).

Prevention of the second fracture is one of the valuable methods to reduce this event. Many studies demonstrated a benefit of bisphosphonate, one of the most common uses of anti-osteoporosis drug, in prevention of the osteoporosis fracture in both first-time and second-time hip fractures, also additional reduction of the mortality rate (9-15). Hence, many clinical practice guidelines have included bisphosphonate as the first-line recommended treatment in patient with osteoporosis (16-20). In Thailand, the treatment recommendation for anti-osteoporosis medications was launched by Thai Osteoporosis Foundation (TOPF) since 2010 and was updated in 2016. Pharmacological treatment of osteoporosis is indicated in hip fracture from low-energy injuries in menopausal women and men aged over 50 years old (21). Unfortunately, even many guidelines suggest using anti-osteoporosis medications in the patients with osteoporotic hip fracture, many studies report relatively low rate of prescription (22-27). Thoroughly understanding the cause of such event may enhance the rate of pharmacological treatment resulting in the prevention of the second fracture and decreasing in mortality rate. Even many literatures investigated the influential factors in anti-osteoporosis medications prescription in osteoporotic fragility fracture (28-32), there are few studies focusing on osteoporotic hip fracture. A number of clinical determinants affecting the absence of medications including age, gender, previous fragility fracture, and BMD measurement were identified but data on non-clinical factors such as health insurance status that may affect the anti-osteoporosis medication received and lead to a low rate of prescription have been

limited. This study aimed to evaluate the opinion of orthopedic surgeons in terms of anti-osteoporosis medication prescription in patients with osteoporotic hip fractures.

CHAPTER 2

LITERATURE REVIEW AND RELATED ARTICLES

By searching electronic data base and citation of the reference, there are three studies evaluating the factor of the physicians in order to prescribe anti-osteoporosis medication by a questionnaire surveillance.

In 2002, Simonelli et al.(33) conducted a surveillance study to determine the barriers in osteoporosis identification and treatment in primary care physicians and orthopedic surgeons. A questionnaire survey was sent to 35 orthopedic surgeons and 75 primary care physicians by mailing. Thirty-one surveys (28%) were returned. Most of the respondents agreed that the responsibility for post-fracture attention are rested with the primary care provider. For the factors of prevent the medication treatment, concerning of the potential adverse effects of medication (61%) was the leading cause followed by cost of treatment (57%). In orthopedic surgeons group, other factors found were reiterated that it was not their responsibility (50%), likely to treat only in elderly patient (50%), likely to treat only in women (38%). In primary physicians group, also likely to treat women than men (65%), in known secondary cause (61%), and in contrast to orthopedic surgeons, would be more likely to treat younger patient (39%). They concluded that all orthopedic surgeons and almost all of the primary care physician agreed that post-fracture attention to osteoporosis should rest with primary care physicians. For the factors prevent the anti-osteoporosis medication prescription, cost of treatment and potential side effect were the two-leading concern.

Ha et al.(34) conducted a questionnaire to all member of Korean Society for Bone and Mineral Research to find out the barriers to osteoporosis treatment in Korea.

The email-based survey was sent to 1,282 members with the response rate of 8.1% (104 of 1,282). Participants demographic were asked for their specialty, type of affiliation according to bed size, age group, the number of patients treated per month, type of patients, and type of the used densitometry. The second part was the questions asked for the barriers to osteoporosis treatment. The result of influence factors was count as six. Lack of patients' awareness was the first leading factor answer (50%), followed by restrictions by health insurance guideline (47%) and cost of treatment (28%). Other factors were lack of physicians' awareness, concerns about adverse effect, concern of effectiveness of medication, and lack of time. They also stated that BMD assessment is a crucial step in diagnosis and treatment of these patients and suggested to improve the reimbursement system of diagnosis and treatment for better patient care.

Gu et. al.(35) conducted the study in 2016 to evaluate the physicians' perspectives on the treatment of osteoporosis patients with bisphosphonate in United States. An online survey was sent to 7,500 prescribers of oral bisphosphonates to women aged $\geq$ 55 years from claims data base. compliance. Physician demographic and practice characteristics such as gender, age, specialty, type of practice, and years in practice were collected. Next, the physicians were asked to rate items as a major, minor, or not consideration in osteoporosis treatment. The items were fragility fracture of family history, body size, lifestyle factors, previous fracture, steroid and medication use, hormone level, ambulation status, BMD test, ethnicity, age at menstruation/menopause, and comorbidity. For the result, 158 physicians completed the survey. Prescription considerations were BMD, steroid use, and a history of fracture were selected as major considerations. For less consideration but more than

50% agree factors were ambulation status, comorbidity, lifestyle factors, family history of fracture, and hormone level. Some physicians were attuned to patients' financial concerns and regard as a major reason for noncompliance with treatment.

After literature review, we would like to pay attention in patients' characteristic: age, gender, comorbidity, steroid use, previous fragility fracture, BMD test, ambulation status, and type of health insurance scheme.

CHAPTER 3

RESEARCH METHODOLOGY

Research question

What are the factors influence in anti-osteoporosis medication in patients with osteoporotic hip fracture?

Hypothesis

Type of health insurance scheme, age, gender, BMD test, ambulation status, and fragility fracture history are associated with anti-osteoporosis medications treatment in patients with osteoporotic hip fracture.

Operational definition

1. Fragility fracture: a fracture caused by injury that would be insufficient to fracture a normal bone, the result of reduced compressive and/or torsional strength of bone. In clinical practice, was defined as *a fracture* that occurs as a result of a minimal trauma, such as a fall from a standing height or less, or no identifiable trauma.

2. Prescription of anti-osteoporosis medications: received whether bisphosphonate, strontium ranelate, denosumab, raloxifene, menatetreone, teriparatide (according to TOPF guideline) concomitant with vitamin D supplement.

3. Type of health insurance scheme: divide to self-pay, universal coverage scheme, social security scheme, and government officer (include state enterprise).

4. Previous fragility fracture: fragility fracture before index hip fracture.

5. Ambulation status: at discharge, divide into able to walk (dependently, assisted) and unable to walk (wheelchair, bed-bound).

Study design: cross-sectional questionnaire study

Methods

      The online survey questionnaire has three parts. Part 1 is a physicians'

characteristics consisting of gender, age, the status of work (in-training in an

orthopedic program or orthopedist), type of affiliation (public hospital with/without

residency training, private hospital), and region (as part of Thailand and Bangkok).

Part 2 is a question of the patients' characteristic factors which may affect the anti-

osteoporosis medication prescription consisting of age, gender, comorbidity, steroid

use, previous fragility fracture, BMD test, ambulatory status. All of these factors were

asked to participants whether these factors have a positive effect (likely to prescribe

the medication) or negative (unlikely to prescribe) or not influential. The health

insurance schemes included the Universal Coverage Scheme, Social Security Scheme,

and Civil Servant Medical Benefits Scheme, and self-pay. Participants were asked

about the health insurance scheme which is likely to prescribe the medication. The

last part is relevant to real-world medical practice consisting of three questions: 1)

"Who is responsible for medication prescription?" (multiple checkboxes and fill in the

blank) 2) "How often do you prescribe medication? (Likert scale 1-10), and 3) "In

case you did not prescribe, what are the reasons?" (multiple checkboxes and fill in the

blank). Content validity of the questionnaire was done by using the index of item-

objective congruence (IOC) by five orthopedic surgeons which all are specialized in

osteoporosis management in orthopedics. All items had a score > 0.6. Given the 2,300

orthopedic surgeons and 400 in-training orthopedic surgeons in Thailand as a finite

population of 2,700, a proportion of 0.50, error 0.05, alpha 0.05, a sample size of 337

was conservatively set as our goal. The questionnaire was sent via email to randomly

selected orthopedic surgeons. Descriptive statistics were used as appropriate. The

protocol of the study was approved by the Institutional Review Board of the Faculty

of Medicine, Chulalongkorn University. We use the consent by action method in

order to obtain the inform consent.

CHAPTER 4

RESULTS

Two hundred and ninety-four participants responded to the survey (response rate of 87.24%). Most of the participants were male (87.07%). The mean age was 33 years (range 25-57; SD 4.8). There were 174 (59.18%) participants currently working as orthopedic surgeons and 119 (40.48%) in-training in an orthopedic program along with one missing data. Most of the workplace are public hospitals which have an orthopedic training program (64.29%) followed by public hospitals with no training program (31.29%) and private hospitals (5.44%). The participants were from all the regions of Thailand, mostly from the Central region (37.07%) and Bangkok (26.19%), followed by Northeastern (11.90%), Southern (7.82%), Northern (7.48%), Eastern (7.14%), and Western (0.68%).

The result of the study in part two, included the questions asked directly whether the factors have an impact on prescribe anti-osteoporosis medication or not. Age of the patients seems to have an effect on medication prescription. Seventy-seven percent of the participants agreed that older patients are likely to prescribe the medication. In contrast, 6% answered that the older age is unlikely to prescribe the medication and 17% responded that the age of the patient has no influence on the medication prescription. For the gender factor, most of the participants agreed that female patients are likely to prescribe the medication (72%) followed by 26% of not influential and 1% of unlikely to prescribe. Underlying disease and ambulation status of the patients seem to have no effect on the medication prescription. For the underlying disease factor, there was a comparable result of a positive effect on medication prescription (43.7%), negative effect (32.5%) and not influential (23.7%).

Ambulation status of the patients resulted as not influential (44.7%) followed by a positive effect (34.6%) and negative effect (20.7%). Steroid usage was a positive factor for medication prescription in 76%, a negative factor in 6% and not influential in 18% of participants.

Previous fragility fracture and BMD result of the patients were responded as a strongly positive factor effect to anti-osteoporosis medication prescription. In both factors, 95% was as a positive factor. Only 1% of participants responded as a negative factor. There was 3% of not influential in medication prescription.

Interestingly, the type of reimbursement seems to have an impact on anti-osteoporosis medication prescription. The leading health insurance scheme that the participants responded as likely to prescribe the medication was government (or state enterprise) scheme (79%) followed by self-pay (49%). Nineteen percent answered as no influence on medication prescription. Summary of the part two result was demonstrated in Figure 1 and the type of reimbursement was presented in Figure 2.

In the last part of the questionnaire, we asked for the opinion of the participants. The first question was "responsible doctor to initiate anti-osteoporosis medication". The orthopedist was in the first place with 99% followed by the endocrinologist (69%), gynecologist (35%), and family medicine doctor (31%). More detail and the other minor answers were shown in Figure 3.

The next question, a 1-10 Likert scale of how frequent the prescription was asked to the participants. The result was varied from 1 to 10 points with a median of 7 points. Detail of the result was showed in Figure 4. When compared this scale between in-training or orthopedist group, and workplace as a public or private group,

there was no significant difference in Likert scale of prescription of the anti-osteoporosis medication (p=0.61 and 0.64 respectively).

The last question was about the reason that one will not prescribe anti-osteoporosis medication. Interestingly, at least 74% of the respondents agreed that the cost of the treatment (too expensive or cannot be reimbursed) was one of the leading causes of not prescribing the medication. The other reasons were concern of side effect (31%), the doctor will not involve in the follow-up process (19%), poor compliance of the patients (12%), no evidence of osteoporosis in these patients (12%), and do not believe in the benefit of the medication (4%). Other minor reasons were demonstrated in Figure 4.
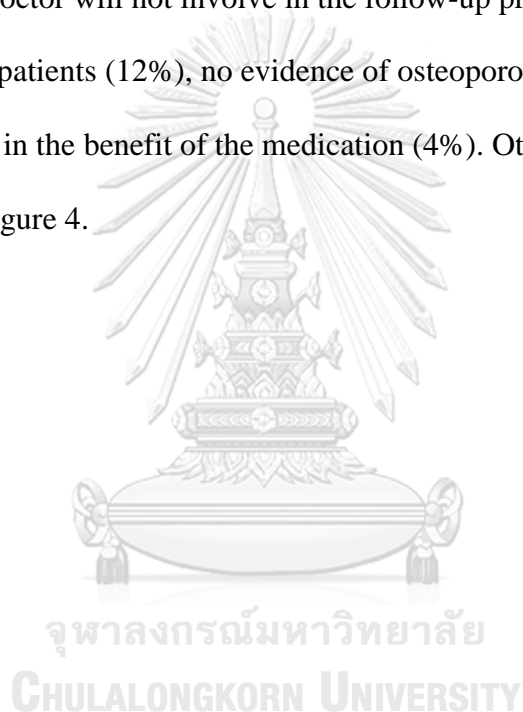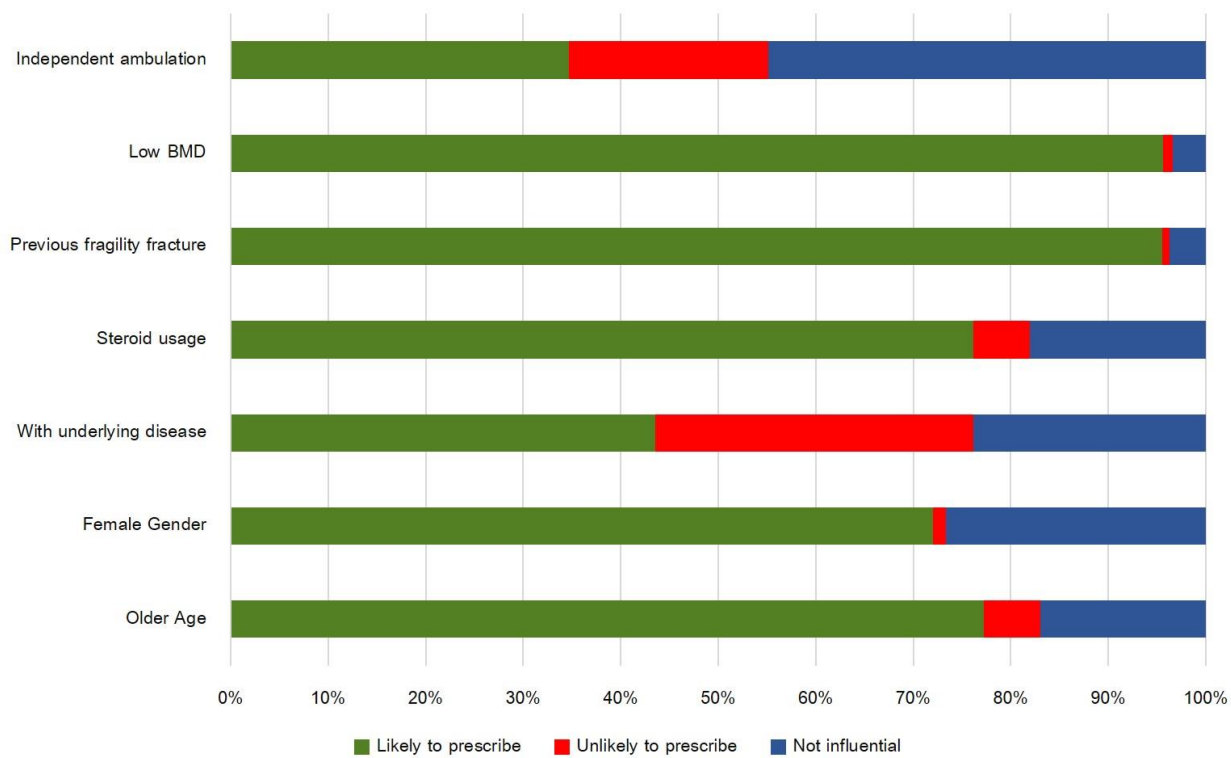
Fig. 1 Factors affecting the prescription of anti-osteoporosis medication
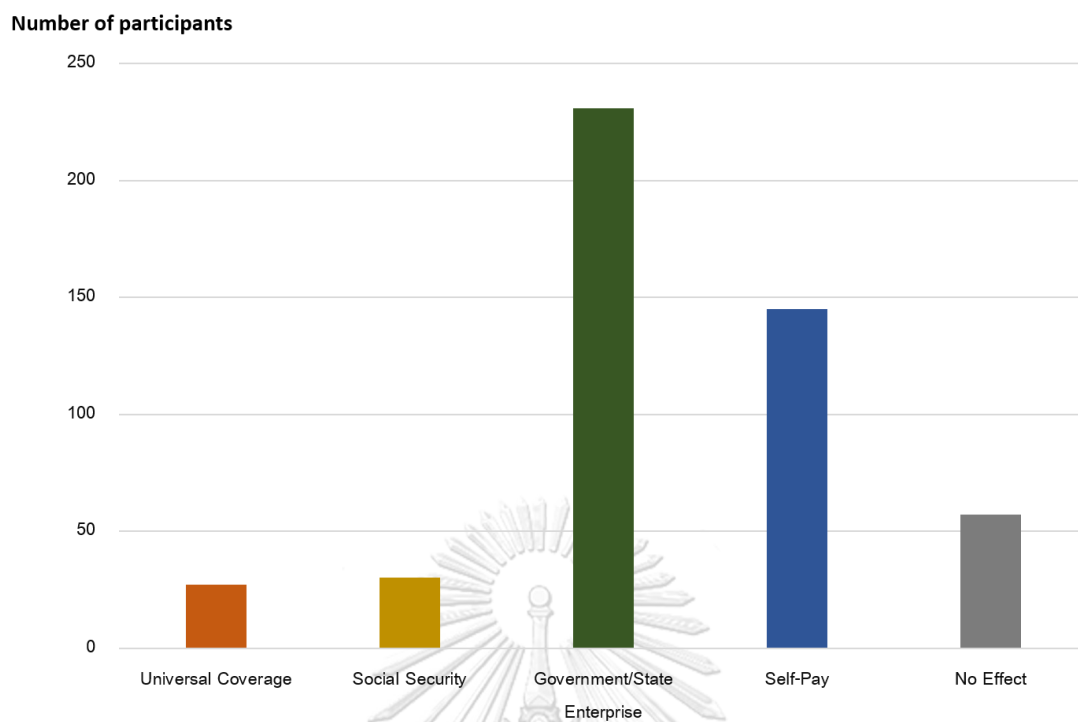
Number of participants

Fig. 2 Health insurance schemes that are likely to be prescribed anti-osteoporosis medication
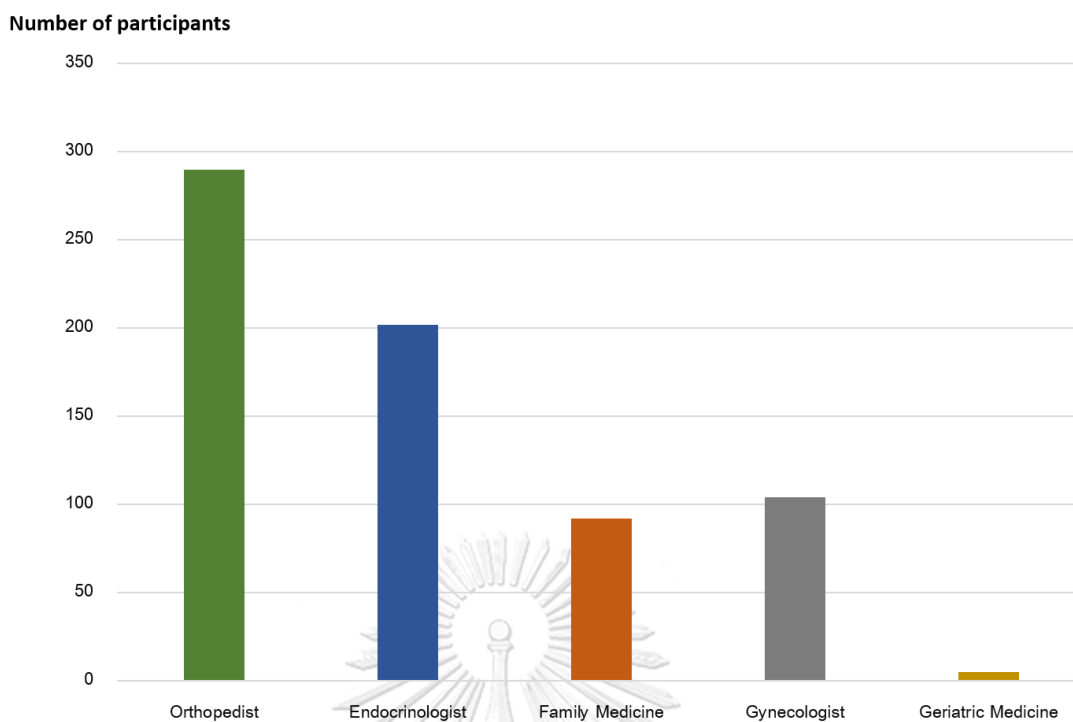
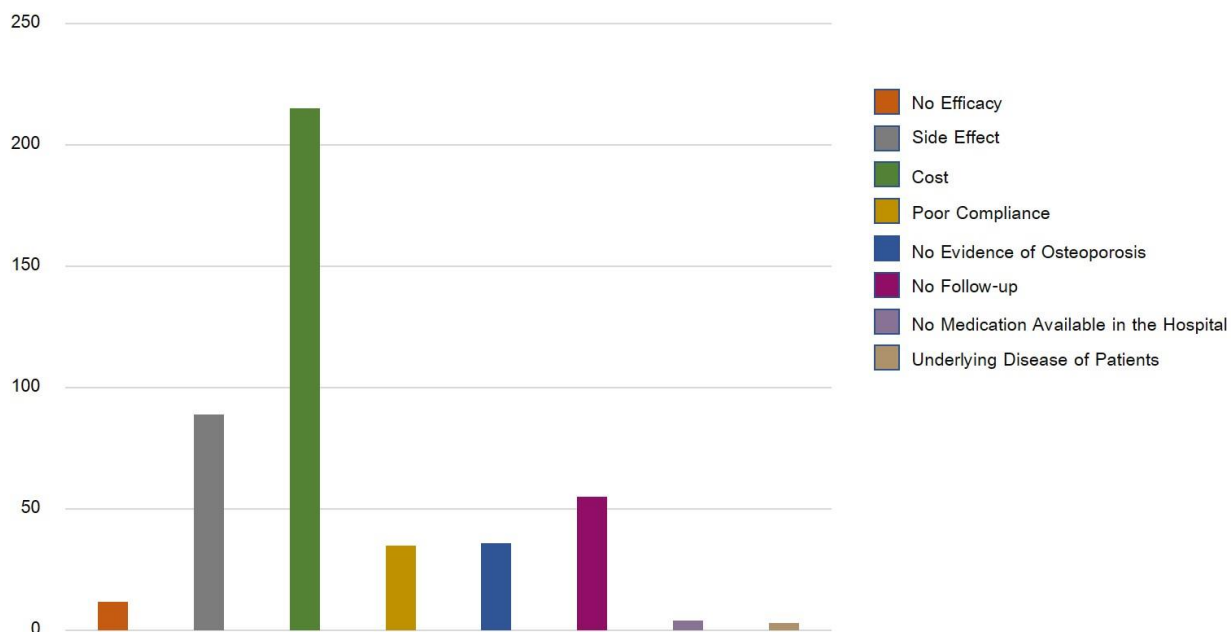**Fig. 3 Medical specialties responsible for prescribing anti-osteoporosis**

medication

Fig. 4 Reasons for not prescribing anti-osteoporosis medication

CHAPTER 5

DISCUSSION

Despite currently recommended guidelines, relatively low rate of anti-osteoporosis medication prescription was encountered all over the world. The aim of this questionnaire survey study is to find the factor affecting the anti-osteoporosis medication prescription. Our hypothesis is that doctor characteristics, patient characteristics, and health system may have an effect on medication prescription.

The two strongest affecting factors in our study were previous fragility fracture and BMD result responded as high as 95% of a positive factor for medication prescription which is comparable to the previous study. In 2016, Gu et al. conducted the study to evaluate the physicians' perspectives on the treatment of osteoporosis patients with a bisphosphonate in the United States (35). A history of previous fracture and BMD were concluded as major consideration factors which are comparable to our study. Since the previous study showed that previous fragility fracture is extremely related to recurrent fracture and should be treated and prevented properly, these patients should receive anti-osteoporosis medications since the first fragility fracture and absolutely, should be an impact factor for receiving medications at the second time. BMD measurement was recommended in every case presenting with fragility fracture. The result of BMD measurement is not beneficial for treatment because fragility fracture is, by itself, an indication for osteoporosis treatment regardless of BMD result. BMD measurement has a benefit in monitoring the efficacy of the treatment. Therefore, whether BMD is measured or not (some institutes are unable to provide the BMD test) it should not alter the rate of anti-osteoporosis medications.

According to the belief that osteoporosis is the "old woman's disease", age and gender of the patients are the undoubted impact factors for anti-osteoporosis medication prescription. Therefore, many pieces of literature stated that female was an important factor for osteoporosis treatment. However, the recent guideline of osteoporosis treatment after hip fracture recommended treatment in both male and female because a number of patients with an osteoporotic fracture are male who will also have a benefit from osteoporosis treatment. Unfortunately, these patients are less likely to be treated even after the fracture occur. This is possibly one of the reasons for the relatively low rate of medication prescription, especially in male patients.

Type of health insurance scheme is also an interesting factor because the cost of the medications is somewhat expensive. In Thailand, bisphosphonate does not currently present in the drug list in the National List of Essential Medicines of Thailand due to its expensiveness. Interestingly, our result demonstrated that type of reimbursement is a remarkable factor influencing the medication prescription. The government/state enterprise scheme, of which the cost of the medication is subsidized, has a high rate of medication prescription compared to other health insurance schemes especially the Universal Coverage Scheme. This result also supports by our last question the first leading reason for not prescribing the medication was due to the cost. This reason, especially in a developing country, maybe an outstanding factor that prevents patients from receiving the medication. This result is comparable to the previous study. Simonelli et al. (33) conducted a surveillance study to determine the barriers in osteoporosis identification and treatment in primary care physicians and orthopedic surgeons. They concluded that the cost of treatment is one of the leading factors which prevent the anti-osteoporosis medication prescription. Another study

also concluded that the cost of treatment is one of the negative factor (34). Lower the cost of the medication and/or including the drug into the national list of essential medicine which allows the other health scheme to access the medication may increase the rate of anti-osteoporosis medication prescription. Further cost-benefit and cost-effectiveness analysis may require for considering the medication into the national drug list. We think this topic is important because this is the only modifiable factor among the other affect factor.

Almost all of the participants agreed that the task of the anti-osteoporosis medication prescription relies on the orthopedist. However, this may result from a sampling bias which all the participants are orthopedists. We believe that it does not matter whether who is responsible for prescribing the medication. The most important thing is to make sure that the patients receive the medication.

This study does have some limitations. We included only orthopedic surgeons/in-training which may cause a sampling bias. Treatment of the osteoporotic fracture is provided by a multidisciplinary team including various medical specialties such as orthopedic, endocrine, family medicine, etc. However, as most of the treatment and follow up in these patients depend on orthopedist who performs an initial treatment and discharge, we collected the data from orthopedic surgeons/in-training only. Despite the good response rate, the findings from this survey are still not representative of the anti-osteoporosis drug prescription as only orthopedic surgeons were included. Generalizability of the findings would be limited to settings similar to Thailand.

The strength of the study is that the information taken from the real-life health care providers. The result of the affecting factors represented the opinion of the

doctors that find out the reason for not prescribing the anti-osteoporosis medication.
From this data, one can use to plan the strategy for expanding the rate of anti-osteoporosis medication prescription, which may lead to a decrease in morbidity and mortality of the patients in the future.

CHAPTER 6

CONCLUSION

The rate of anti-osteoporosis medication prescription after fragility hip fracture is very low despite being recommended by the national guideline. Knowing the factors affecting the prescription of anti-osteoporosis medication is beneficial for strategic planning in order to increase the rate of prescription. In the study, apart from the non-modifiable such as previous fragility fracture, BMD result, age, and gender that related to anti-osteoporosis medication prescription in patient with osteoporotic hip fracture, we also found that cost of the medication and type of health insurance scheme, which are modifiable factor seem to be influence to the medication prescription. The gap of treatment may be reduced, and the morbidity and mortality of the patients can be decreased.

Appendix: Questionnaire

แบบสอบถามเรื่อง ความคิดเห็นในการจ่ายยาในการรักษาโรคกระดูกพรุนในผู้ป่วยที่มีกระดูกสะโพกหักจากภาวะกระดูกพรุน

(Osteoporotic hip fracture) ของแพทย์ออร์โธปิดิกส์

เนื่องด้วยปัจจุบัน มูลนิธิโรคกระดูกพรุนแห่งประเทศไทยได้มีคำแนะนำให้ใช้ยาในผู้ป่วยที่มีกระดูกสันหลังหัก หรือ

กระดูกสะโพกหัก อันเนื่องมาจากภยันตรายที่ไม่รุนแรงสำหรับผู้หญิงที่หมดประจำเดือน และผู้ชายที่มีอายุตั้งแต่ 50 ปีขึ้นไป

อย่างไรก็ตาม การจ่ายยาในกลุ่มนี้ (Bisphosphonate, Strontium ranelate, Denosumab, Raloxifen,

Menatetrenone, Teriperatide) ยังมีอัตราการจ่ายที่ค่อนข้างต่ำทั้งในประเทศไทยและทั่วโลก แบบสอบถามนี้จัดทำ

ขึ้นเพื่อประเมินความคิดเห็นของแพทย์ออร์โธปิดิกส์ ในการจ่ายยาในผู้ป่วยประเภทนี้ ข้อมูลที่ท่านได้ตอบแบบสอบถามจะเก็บเป็น

ความลับและจะรายงานผลในภาพรวมใหญ่เท่านั้น

ส่วนที่ 1 ข้อมูลทั่วไป

    1.1 เพศ   ☐ ชาย   ☐ หญิง

    1.2 อายุ ……………… ปี

    1.3 สถานะการทำงาน

      ☐ แพทย์ออร์โธปิดิกส์ที่กำลังศึกษาอยู่ในสถาบันฝึกอบรม

      ☐ แพทย์ออร์โธปิดิกส์ที่ผ่านการฝึกอบรมแล้ว

    1.4 สถานที่ทำงานประจำ

      ☐ โรงพยาบาลรัฐที่มีการtrain resident/แพทย์พี่เลี้ยง

      ☐ โรงพยาบาลรัฐที่ไม่มีการtrain resident/แพทย์พี่เลี้ยง

      ☐ โรงพยาบาลเอกชน

1.5 ภูมิภาคที่ทำงาน

☐ ภาคเหนือ

☐ ภาคตะวันออกเฉียงเหนือ

☐ ภาคตะวันออก

☐ ภาคตะวันตก

☐ ภาคกลาง

☐ ภาคใต้

☐ กรุงเทพมหานคร

ส่วนที่ 2 ปัจจัยของผู้ป่วยต่อการได้รับยารักษาโรคกระดูกพรุน: ในผู้ป่วยที่มีภาวะกระดูกสะโพกหักจากภยันตรายที่ไม่ร้ายแรง

(Osteoporotic hip fracture) ท่านคิดว่าปัจจัยต่อไปนี้ข้อใดมีผลต่อการได้รับยา รักษาโรคกระดูกพรุน หรือเลือกไม่มีผล

หากท่านคิดว่าปัจจัยนั้นๆไม่มีผลต่อการได้รับยาของผู้ป่วย

2.1 อายุของผู้ป่วย

☐ อายุที่มาก ทำให้มีโอกาสได้รับยามากขึ้น

☐ อายุที่มาก ทำให้มีโอกาสได้รับยาน้อยลง

☐ อายุ ไม่มีผลต่อการได้รับยา

2.2 เพศของผู้ป่วย

☐ เพศหญิง ทำให้มีโอกาสได้รับยามากขึ้น

☐ เพศหญิง ทำให้มีโอกาสได้รับยาน้อยลง

☐ เพศ ไม่มีผลต่อการได้รับยา

2.3 โรคประจำตัวของผู้ป่วย

☐ ผู้ป่วยที่มีโรคประจำตัว ทำให้มีโอกาสได้รับยามากขึ้น

☐ ผู้ป่วยที่มีโรคประจำตัว ทำให้มีโอกาสได้รับยาน้อยลง

☐ โรคประจำตัว ไม่มีผลต่อการได้รับยา

2.4 ยาในกลุ่ม steroid

☐ ผู้ป่วยที่มีการใช้ยา steroid ทำให้มีโอกาสได้รับยามากขึ้น

☐ ผู้ป่วยที่มีการใช้ยา steroid ทำให้มีโอกาสได้รับยาน้อยลง

☐ การใช้ยา steroid ไม่มีผลต่อการได้รับยา

2.5 ประวัติกระดูกหักจากภยันตรายที่ไม่ร้ายแรงในอดีต (Previous fragility fracture)

☐ ผู้ป่วยที่ มีประวัติ Fragility fracture ทำให้มีโอกาสได้รับยา มากขึ้น

☐ ผู้ป่วยที่ มีประวัติ Fragility fracture ทำให้มีโอกาสได้รับยา น้อยลง

☐ ประวัติ Fragility fracture ไม่มีผลต่อการได้รับยา

2.6 ผลการตรวจ BMD ของผู้ป่วย

☐ ผู้ป่วยที่มีผลการตรวจ BMD ต่ำกว่าค่าปกติ ทำให้มีโอกาสได้รับยา มากขึ้น

☐ ผู้ป่วยที่มีผลการตรวจ BMD ต่ำกว่าค่าปกติ ทำให้มีโอกาสได้รับยา น้อยลง

☐ ผู้ป่วยที่มีผลการตรวจ BMD ต่ำกว่าค่าปกติ ทำให้มีโอกาสได้รับยา น้อยลง

2.7 Ambulation status ของผู้ป่วย (เดินได้คือสามารถเดินได้เองหรือใช้การช่วยเหลือต่างๆ, เดินไม่ได้คือ wheelchair หรือ bedbound)

☐ ผู้ป่วยที่ เดินได้ ทำให้มีโอกาสได้รับยา มากขึ้น

☐ ผู้ป่วยที่ เดินได้ ทำให้มีโอกาสได้รับยา น้อยลง

☐ Ambulation status ของผู้ป่วย ไม่มีผลต่อการได้รับยา

2.7 สิทธิ์การรักษาของผู้ป่วย (กรุณาทำเครื่องหมายในสิทธิ์การรักษาที่ท่านคิดว่ามีโอกาสในการได้รับยามากขึ้นโดยทำ เครื่องหมายได้มากกว่า 1 ช่อง)

☐ สิทธิ 30 บาท (Universal coverage scheme)

☐ สิทธิประกันสังคม (Social security scheme)

☐ สิทธิข้าราชการหรือรัฐวิสาหกิจ (Government or state enterprise scheme)

☐ จ่ายเงินด้วยตนเอง (Self-pay)

☐ ประเภทของสิทธิการรักษา ไม่มีผลต่อการได้รับยา

ส่วนที่ 3 การปฏิบัติงานจริง

3.1 ท่านคิดว่าการให้ยารักษากระดูกพรุนในผู้ป่วยกลุ่มนี้เป็นหน้าที่ของใคร (ตอบได้มากกว่า 1 ข้อ)

☐ แพทย์ออร์โธปิดิกส์ (Orthopedist)

☐ แพทย์อายุรกรรมต่อมไร้ท่อ (Endocrinologist)

☐ แพทย์เวชศาสตร์ครอบครัว (Family medicine)

☐ แพทย์นรีเวช (Gynecologist)

☐ อื่นๆ(โปรดระบุ)

3.2 ในผู้ป่วยที่มาด้วย osteoporosis hip fracture ท่านได้จ่ายยารักษาโรคกระดูกพรุนมากเพียงใด

	1	2	3	4	5	6	7	8	9	10	
ไม่เคยจ่ายเลย	◯	◯	◯	◯	◯	◯	◯	◯	◯	◯	จ่ายทุกครั้ง

3.3 ในกรณีที่ท่านไม่ได้จ่ายยาหลังจากทำการรักษา hip fracture แล้ว ข้อใดเป็นสาเหตุที่สำคัญ (เลือกได้มากกว่า

1 ข้อ)

☐ คิดว่าไม่มีประโยชน์

☐ กังวลถึงผลข้างเคียง

☐ ยามีราคาแพงและเบิกไม่ได้

☐ คิดว่าผู้ป่วย compliance ไม่ดี

☐ คิดว่าไม่มีหลักฐานชัดเจนว่ากระดูกพรุนเป็นสาเหตุที่ทำให้เกิดกระดูกหัก

☐ ไม่ได้เป็นผู้ follow-up ติดตามผู้ป่วย

☐ คิดว่าไม่ใช่หน้าที่ของแพทย์ออร์โธปิดิกส์ในการจ่ายยาชนิดนี้

☐ อื่นๆ (โปรดระบุ)...........

ขอขอบพระคุณในความร่วมมือ

REFERENCES

1.   Affairs UNDoEaS. World Population Prospects : The 2008 Revision. Population Newsletter. 2009.

2.   Brauer CA. Incidence and Mortality of Hip Fractures in the United States. Jama. 2009;302:1573.

3.   Schnell S, Friedman SM, Mendelson DA, Bingham KW, Kates SL. The 1-Year Mortality of Patients Treated in a Hip Fracture Program for Elders. Geriatric Orthopaedic Surgery & Rehabilitation. 2010;1:6-14.

4.   Haentjens P, Magaziner J, Colón-Emeric CS, Vanderschueren D, Milisen K, Velkeniers B, et al. Meta-analysis: excess mortality after hip fracture among older women and men. Annals of internal medicine. 2010;152:380-90.

5.   Cooper C. The crippling consequences of fractures and their impact on quality of life. The American Journal of Medicine. 1997;103:S12-S9.

6.   Klotzbuecher CM, Ross PD, Landsman PB, Abbott TA, Berger M. Patients with Prior Fractures Have an Increased Risk of Future Fractures: A Summary of the Literature and Statistical Synthesis. Journal of Bone and Mineral Research. 2010;15:721-39.

7.   Chapurlat RD, Bauer DC, Nevitt M, Stone K, Cummings SR. Incidence and risk factors for a second hip fracture in elderly women. the Study of Osteoporotic Fractures. Osteoporosis International. 2003;14:130-6.

8.   Berry SD, Samelson EJ, Hannan MT, Mclean RR, Lu M, Cupples LA, et al. Second Hip Fracture in Older Men and Women. Arch Intern Med. 2008;167:1971-6.

9.   Beaupre LA, Morrish DW, Hanley DA, Maksymowych WP, Bell NR, Juby AG, et al. Oral bisphosphonates are associated with reduced mortality after hip fracture. Osteoporosis International. 2011;22:983-91.

10.   Black DM, Thompson DE, Bauer DC, Ensrud K, Musliner T, Hochberg MC, et al. Fracture risk reduction with alendronate in women with osteoporosis: The fracture intervention trialfgsfg. The Journal of Clinical Endocrinology & Metabolism. 2000;85:4118-24.

11.   Brozek W, Reichardt B, Zwerina J, Dimai HP, Klaushofer K, Zwettler E. Antiresorptive therapy and risk of mortality and refracture in osteoporosis-related hip fracture: a nationwide study. Osteoporosis International. 2016;27:387-96.

12.   Byun J, Jang S, Lee S, Park S, Yoon HK, Yoon B-H, et al. The Efficacy of Bisphosphonates for Prevention of Osteoporotic Fracture: An Update Meta-analysis. Journal of Bone metabolismone metabolism. 2017;24:37-49.

13.   Donggrell SA. New horizons for zoledronic acid: Results of the HORIZON trials in postmenopausal women with osteoporosis and after hip fracture. Expert Opinion on Pharmacotherapy. 2008;9:663-8.

14.   Lyles KW C-EC, Magaziner JS, Adachi JD, Pieper CF, Mautalen C et al. the HORIZON Recurrent Fracture Trial (2007) Zoledronic acid and clinical fractures and mortality after hip fracture. N Engl J Med. 2007;357:1799-809.

15.   Morin S, Rahme E, Behlouli H, Tenenhouse A, Goltzman D, Pilote L. Effectiveness of antiresorptive agents in the prevention of recurrent hip fractures. Osteoporosis International. 2007;18:1625-32.

16.   Chan SP, Sim YS, Lee EGM, Chee W, Lee HF, Kiong LJ, et al. Clinical guidance on management of osteoporosis 2012. Malaysian Osteoporosis Society. 2012;12.

17.   Compston J, Cooper A, Cooper C, Francis R, Kanis J, Marsh D, et al. Guideline for the diagnosis and management of osteoporosis in postmenopausal

women and men from the age of 50 years in the UK. National Osteoporosis Guideline Group. 2014:1-10.

18.   Cosman F, de Beur SJ, LeBoff MS, Lewiecki EM, Tanner B, Randall S, et al. Clinician's Guide to Prevention and Treatment of Osteoporosis. Osteoporosis International. 2014;25:2359-81.

19.   Orimo H, Nakamura T, Hosoi T, Iki M, Uenishi K, Endo N, et al. Japanese 2011 guidelines for prevention and treatment of osteoporosis-executive summary. Archives of Osteoporosis. 2012;7:3-20.

20.   Papaioannou A, Morin S, Cheung AM, Atkinson S, Brown JP, Feldman S, et al. Clinical Practice Guidelines for the Diagnosis and Management of Osteoporosis in Canada : Background and Technical Report. Clinical Practice Guidelines Osteoporosis: Background and Technical Report. 2010:1-89.

21.   Songpatanasilp T, Sritara C, Kittisomprayoonkul W, Chaiumnuay S, Nimitphong H, Charatcharoenwitthaya N, et al. Thai Osteoporosis Foundation (TOPF) position statements on management of osteoporosis. Osteoporosis and Sarcopenia. 2016;2:191-207.

22.   Aguado-Maestro I, Panteli M, García-Alonso M, Bañuelos-Díaz A, Giannoudis PV. Incidence of bone protection and associated fragility injuries in patients with proximal femur fractures. Injury. 2017.

23.   Iba K, Dohke T, Takada J, Sasaki K, Sonoda T, Hanaka M, et al. Improvement in the rate of inadequate pharmaceutical treatment by orthopaedic surgeons for the prevention of a second fracture over the last 10 years. Journal of orthopaedic science : official journal of the Japanese Orthopaedic Association. 2017.

24. Jennings LA, Auerbach AD, Maselli J, Pekow S, Lindenauer PK, Lee SJ. Missed Opportunities for Osteoporosis Treatment in Patients Hospitalized for Hip Fracture. J Am Geriatr Soc. 2010;58:650-7.

25. Klop C, Gibson-Smith D, Elders PJM, Welsing PMJ, Leufkens HGM, Harvey NC, et al. Anti-osteoporosis drug prescribing after hip fracture in the UK: 2000–2010. Osteoporosis International. 2015;26:1919-28.

26. Rojanasthien S, Chiewchantanakit S, Vaseenon T. Diagnosis and treatment of osteoporosis following hip fracture in Chiang Mai University Hospital. Journal of the Medical Association of Thailand. 2005;88 Suppl 5:S65-71.

27. Solomon DH JS, Boytsov NN et al. Osteoporosis medication use after hip fracture in U.S. Patients between 2002 and 2011. Journal of Bone and Mineral Research. 2014;29:1929-37.

28. Bessette L, Jean S, Davison KS, Roy S. Factors influencing the treatment of osteoporosis following fragility fracture. Osteoporosis Internationals. 2009;20:1911-9.

29. Devold H, Sogarrd A, Tverdal A, Falch J, Furu K, Meyer H. Hip fracture and other predictors of anti-osteoporosis drug use in Norway. Osteoporosis International. 2013:1225-33.

30. Flais J, Coiffier G, Noach JL, Albert JD, Faccin M, Perdriger A. Low prevalence of osteoporosis treatment in patients with recurrent major osteoporotic fracture. Archives of Osteoporosis. 2017;12:1-10.

31. Gani L, Reddy SK, Alsuwaigh R, Khoo J, King TFJ. High prevalence of missed opportunities for secondary fracture prevention in a regional general hospital setting in Singapore. Archives of Osteoporosis. 2017;12:10-3.

32.   Roerholt C, Eiken P, Abrahamsen B. Initiation of anti-osteoporotic therapy in patients with recent fractures: a nationwide analysis of prescription rates and persistence. Osteoporosis International. 2009;20:299-307.

33.   Simonelli C, Killeen K, Mehle S, Swanson L. Barriers to osteoporosis identification and treatment among primary care physicians and orthopedic surgeons. Mayo Clinic proceedings Mayo Clinic. 2002;77:334-8.

34.   Ha Y-C, Lee Y-K, Lim Y-T, Jang S-M, Shin CS. Physicians' Attitudes to Contemporary Issues on Osteoporosis Management in Korea. Journal of Bone Metabolism. 2014;21:143.

35.   Gu T, Eisenberg Lawrence DF, Stephenson JJ, Yu J. Physicians' perspectives on the treatment of osteoporosis patients with bisphosphonates. Clinical interventions in aging. 2016;11:1-8.

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Wichan Kanchanatawan, Sunikom Suppauksorn, Worawit Densiri-aksorn, Piyabuth Kittithamvongs, Warongporn Pongpinyopap. Fluoroscopic technique for open reduction and internal fixation of proximal humeral fracture using the proximal humeral locking plate: proposal of "plate" and "screw" view. Arthroscopy Techniques. 2017.e1-e6

Sombat Kunakornsawat, Nut Popan, Chaiwat Piyaskulkaew, Prtisanai Pruttikul, Tinnakorn Pluemvitayaporn, Piyabuth Kittithamvongs. Prevalence of idiopathic scoliosis in Thai female students aged 11-13 years. Journal of the Medical Association of Thailand. 2017;100(5)533 `

Sombat Kunakornsawat, Rachata Tungrisipat, Dechporn

Putthiwara, Chaiwat Piyaskulkaew, Tinnakorn Pluemvitayaporn, Pritsanai Pruttikul, Piyabuth Kittithamvongs. Postoperative kinetics of C-reactive protein and erythrocyte sediment rate in one-, two-, and multilevel posterior spinal decompressions and instrumentation. Global Spine Journal. 2017;7(5)

Sombat Kunakornsawat, Pema Letho, Tinnakorn Pluemvitayaporn, Pritsanai Pruttikul, Chaiwat Piyaskulkaew, Kanthika Wasinpongwanich, Piyabuth Kittithamvongs. Variation of C1 Spinolaminar line and prevalence of C1 stenosis in normal population. Eur Journal of Orthopaedic Surgery and Traumatology. 2018;28(6)1029-1032

Chairoj Uerpairojkit, Piyabuth Kittithamvongs, Dechporn Putiwara, Navapong Anatavoraskul, Kanchai Malungpaishorpe, Somsak Leechavengvongs. Surgical Anatomy of the Dorsal Cutaneous Branch of the Ulnar Nerve and Its clinical Significance in Surgery at the Ulnar Side of the Wrist. J Hand Surg Eur Vol. 2019 Mar;44(3):263-268

Piyabuth Kittithamvongs, Krit Pongpirul. Prescription practices of anti-osteoporosis medication among Thai Orthopedic Surgeons (PAMOS Study) in Osteoporotic Hip Fracture. Arch Osteoporos. (2019) 14:62

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