

# Cost Management of Cleft Lips under the Universal Health Coverage Program of the Tawanchai Cleft Center, Srinagarind Hospital, Faculty of Medicine, Khon Kaen University

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**Background:** The study of cost management with regard to cleft lip patients under the Universal Health Coverage Program at Tawanchai Cleft Center, Srinagarind Hospital, Faculty of Medicine, Khon Kaen University, was conducted in order to provide fundamental information for the administrative team on how best to administrate and manage the organization.

**Objective:** To study the cost management of cleft lip patients under the Universal Health Coverage Program. To compare individual patient management costs and costs from the National Health Security Office (NHSO), and to offer proper guidelines for cost management to the organization.

**Material and Method:** The study was performed retrospectively. The data were collected by reviewing secondary sources of information from patients with cleft lips who consistently underwent treatment at Tawanchai Cleft Center. As for the provider prospects, the cost management did not address the other expenses. The study analyzed the comparison between cost management and income from the Universal Health Coverage Program, which it received from the National Health Security Office (NHSO). The study was conducted over 2 years (October 1, 2010 to 30 September, 2013). There were 21 patients in this study. Microsoft excel was the instrument used to calculate the cost of management.

**Results:** 1) Total costs were lower than real payments because this cost did not take into account the total cost of the operation room, patient room, common bed, and costs of the medical equipment. Moreover, the information regarding the building's price and the facility were not clear enough. The database of materials and equipment was also not yet complete. 2) The average cost of patient management was 12,025.14 Baht per person, but the compensation received from the National Health Security Office (NHSO) averaged 10,527.63 Baht per person, which was 87.55% of the total cost management. The department with the largest expenses was Anesthesia (36.42%).

**Conclusion:** This study indicated that the cost of patient management is lower than usual due to the lack of clear cost information. The cost of medical care, which was received from the National Health Security Office (NHSO), was only 87.55%; the department with the highest costs was Anesthesia (36.42%).

**Keywords:** Cost Management, Cleft lip/cleft palate, Tawanchai cleft center

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Cleft lips and cleft palates (CLP) are common congenital deformities that can cause multiple problems affecting patients and families both physically and mentally. Cleft lips and cleft palates have the most incidences, especially in the rural areas of the Northeast Thailand. Bowornsilp Chowchuen investigated the

epidemics and the development of care in patients with cleft lips and cleft palates in six provinces from 2003-2004. It was found that the incidence of patients with CLP in Pitsanulok, Saraburi, Khon Kaen, Buriram, Songkhla, and Lei province were 2.25, 1.70, 1.56, 1.50, 1.10, 0.58/1,000 newborns, respectively. The effectiveness and the accuracy of data collection caused the differentiation of the incidences. Patients' reports have built up collaboration between the executive team and the medical staff in order to develop a referral system<sup>(1)</sup>.

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The estimation of the number of incidences of patients with CLP could be in the range of 0.75-5.4/1,000 newborns or approximately 1.43-4.85/100,000 newborns. It could be stated that the number of incidences of patients with CLP was approximately 9.5-34/1,000 newborns<sup>(2)</sup>. Cleft lips and cleft palates cause complications which affect a person both physically and mentally. It takes long-term medical treatment starting when she/he is born until she/he is fully grown until 19 years old. It is necessary to cooperate with a multidisciplinary team; therefore collaboration with patients, families, and a multidisciplinary team was vital and essential<sup>(3)</sup>. Srinagarind Hospital, the Faculty of Medicine, Khon Kaen University, was the first tertiary care center, the university hospital in Northeast Thailand, in collaboration with the Department of Orthodontics, Faculty of Dentistry, Khon Kaen University. Patients with CLP require continuous care from a coordinated, multidisciplinary team.

Later, in 1999, a research team called “Multidisciplinary management of cleft lip, cleft palate and craniofacial anomalies” was established to investigate and improve multidisciplinary management of CLP and craniofacial deformities. The group continues to be headed by Professor Dr. Bowornsilp Chowchuen, the Head of Plastic surgery division, Faculty of Medicine. The team includes obstetricians,

pediatricians, plastic surgeons, neurosurgeons, otolaryngologists, orthodontists, dental surgeons, anesthesiologists, psychiatrists, speech therapists, nurses, social workers, and biostatisticians. In 2004, the Tawanchai Center “Cleft Lip, Cleft Palate and Craniofacial Anomalies Center” was established. They developed activities that focus on the care, treatment, and collaboration.

The present study of Orathai Lekboonyasin<sup>(5)</sup> found the patients with cleft lip-cleft palate who underwent treatment at Srinagarind Hospital from 1984-2008.

1) The demography of patients with cleft lips and cleft palates was 1,950 people who were admitted at the hospital 3,342 times. The majority of patients were male (1,098 people, 56.3%) with the remaining patients female (852 people, 43.7%), respectively.

2) The epidemic of the patients who received treatment was cleft lips (621 people, 31.8%) and cleft palates (438 people, 22.5%) and both cleft lips and cleft palates (891 people, 45.7%), respectively.

3) The majority of patients with CLP live in Khon Kaen (652 people, 33.4%), followed by Maha Sarakham (318 people, 16.3%) and Kalasin (219 people, 11.2%) respectively.

The Government of Thailand introduced “30 Baht Health Care Scheme” with the aim of providing

**Table 1.** Tawanchai treatment guideline in management of cleft lip-cleft palate and craniofacial deformities<sup>(2,3)</sup>

Age period	Treatment	Team members
Prenatal	Prenatal imaging and counseling	Obstetrician and multidisciplinary team
Newborn	Breast feeding, evaluation and management of anomalies. Provide information	Multidisciplinary team
0-3 months	Pre-surgical orthopedics (if necessary)	Plastic surgeon, Orthodontist
3-4 months	Primary surgical lip-nose repair	Plastic surgeon
12 months	Primary cleft palate repair with intravelar veloplasty with or without Myringotomy and tubes	Plastic surgeon, Otolaryngologist
4-6 years (pre-school age)	Evaluation of THAICLEFT 5 year-index, Secondary rhinoplasty, Correction of velopharyngeal insufficiency	Plastic surgeon, Speech-language pathologist, Orthodontist, Psychologist, and multidisciplinary team
9-11 years (mixed dentition)	Evaluation of THAICLEFT 10 year-index, Secondary alveolar bone grafting	Plastic surgeon, Orthodontist, Maxillofacial surgeon and multidisciplinary team
13-15 years	Orthodontic treatment monitoring. Assessment of speech and language impairments	Orthodontist, Speech pathologist
16-18 years	Orthognatic surgery (if necessary) Lip-nose revision (if necessary) Patient/family satisfaction	Plastic surgeon, Orthodontist, Maxillofacial surgeon, and multidisciplinary team
>19 years	Evaluation treatment outcomes	Multidisciplinary team

reasonable health care, which was meant to reach to all populations. For every scheme, participants may access registered health services. Hence, the health services have to acknowledge the total cost management in order to compare the real cost management and the compensation received from the government. Furthermore, health services have to calculate the output cost, which follows the New Public Management by using the “Financial Management 7 hurdles”. One of these hurdles is “the output costing”. The government has a financial system in order to manage the total cost management of major activities, which are clearly indicated: activity and product of activity, direct costing guidelines and indirect costs, monitoring system, cost management, changing ability, and increasing governmental cost.

Therefore, it is crucial for the executives and the policymakers to acknowledge the performance of cost per health service in the hospital in order to use resources effectively. Besides, they could plan and approximate for expanding the need of the medical care. Moreover, it is beneficial to audit the evaluation of work performance concurrently with the evaluation of the activity approach<sup>(6,7)</sup>. As for the financial and accounting analysis, selecting the study of cost management at Tawanchai Center for Cleft Lip-Cleft Palate provides multidisciplinary treatment and the center also collaborates between the patients and families. It is associated with the Faculty of Medicine and Faculty of Dentistry. This association has existed for more than 10 years<sup>(8)</sup>.

Accordingly, the study of Rampan Pattaranit<sup>(9)</sup> showed the medical cost of patients who were admitted at the hospital aged 4-5 years old at Tawanchai Cleft Center, Srinagarind Hospital from May-June, 2012. The total number of patients was 120 people. The majority of these patients was male (57.5%), had cleft lips and cleft palates (60.8%), and most lived in Khon Kaen. The majority of patients who live in Khon Kaen will receive compensation from the National Health Security Office (NHSO) per total cost management at Srinagarind Hospital, approximately 3:4. Therefore, it can be said that 1 (Adjusted Relative Weight or Adj. RW) was 7,700 Baht. Comparing the medical cost for patients with cleft lips at Srinagarind Hospital and the per relation weight that was received from the National Health Security Office (NHSO), it was found that the hospital received approximately 75.75% compensation, which is lower than the average. Therefore, analyzing the cost management will lead to effective equipment, which then leads to appropriate standards for a

better hospital under limited cost and also offers the support from the government in order to produce just management for further quality service.

### **Objective**

1) To study the cost management concerning cleft lips patients under the Universal Health Coverage Program, which consistently received 2-3 years of treatment at Tawanchai Cleft center, Srinagarind Hospital, Faculty of Medicine, Khon Kaen University.

2) To compare individual patient management costs and costs from the National Health Security Office (NHSO), and income from medical care.

3) To offer proper guidelines for cost management to the organization and society.

### **Material and Method**

The study was performed retrospectively. The data were collected by reviewing secondary source information from patients with cleft lips who consistently underwent treatment at Tawanchai Cleft Center. As for the provider prospects, the cost management did not concentrate on other expenses. The data were reviewed from patient medical records of those between 2-3 years old, Srinagarind Hospital. Twenty-one patients underwent the operation at Srinagarind Hospital. The Board of Ethic committee approved this study, Khon Kaen University (HE 561389) as well as the experts who had already examined and reviewed the research guidelines approved it.

### **Data collection**

The present study was performed retrospectively. The data were collected by reviewing secondary source information from patients with cleft lips who consistently underwent treatment at Tawanchai Cleft Center. Following is the budget from 2012-2013.

1) As for the provider prospects, the study of cost management did not focus on intangible costs.

2) Total cost management is collected from the reimbursement system, accounting and financial systems, and the medical units.

3) The number of patients was collected from the medical records.

4) The patient's income, which was received from the National Health Security Office (NHSO), was collected from the financial records, finance unit, division of finance, Faculty of Medicine, Khon Kaen University.

5) The medical treatment of patients is collected from the medical records.

6) The data collection, collected from questionnaires, is as follows:

1. Statistic of patients' medical service.
2. General information of the hospital.
3. Labor cost.
4. Working hours.
5. Material cost.
6. Capital cost.

7) Microsoft excel was the instrument which was used to calculate the cost of management.

8) The statistics, which were used to analyze the medical cost management, is as below:

1. Percentage

$$\text{Percentage} = \frac{X_i \times 100}{X_n}$$

$X_i$  = List of numbers

$X_n$  = Total numbers

2. Mean is the most common type of average.

It is the sum of a list of numbers divided by the size of the list

$$\text{Mean } (\bar{X}) = \frac{\sum X_i}{N}$$

$\sum X_i$  = Sum of a list of numbers from 1 to n

$N$  = Size of the list

9) Comparing individual cost management per patient, charge cost and income from the government.

10) Analyzing the problems and purposing appropriate guidelines of cost management.

## Results

### *Real cost management which was calculated from the micro-costing*

Analyzing a direct cost management of individual medical service cost with two patients. According to the information of the resources, medical services, medical record, and database of the hospital, cost management is calculated from the medical unit, which average service in the hospital such as consulting, medical check up, one time-operation and the admission time at the ward was counted from patient records and post-op monitoring. On the one hand, the medical cost management of patient No. 1 was 4,429.06 Baht, while the charge cost from the National Health Security Office (NHSO) was 17,941 Baht. Cost management is lower than the charge cost by 13,511.94 Baht (75.31%). On the other hand, the medical cost management of patient No. 2 was 6,533.43 Baht while the charge cost from the National Health Security Office (NHSO) was 13,746 Baht. Cost management is lower

than the charge cost by 7,212.57 Baht (52.47%).

Nevertheless, this cost management did not include the cost of the operating room, patient room, common bed, or the medical equipment. This is because the information regarding the building's price and facility was not clear enough. The database of material and equipment was also incomplete. Therefore, the study of cost management is lower than usual, as related to the complete information on medical records, which will add up to the calculation of cost management.

### *Comparing the income and the charge cost received from the National Health Security Office (NHSO)*

According to the present study, the charge cost from the National Health Security Office (NHSO) was 415,855 Baht. It was an average of 19,802.62 Baht per person. The compensation's data of 21 patients, which was received from the National Health Security Office (NHSO), were incomplete. It was found that five patient HNs were not correct due to the medical record's being disorganized and with some potentially missing data. Therefore, the net of charge cost from the National Health Security Office (NHSO) was 221,080.24 Baht, or on average 10,527.63 Baht per person. The total cost was 252,528 Baht or an average of 12,025.14 Baht per person (87.55%). It is calculated from the DRG rate, which ranged from 7,700-9,600 Baht multiplied by Adj. Rw.

### *The proportion of total cost management from patients with cleft lips*

The total cost management of 21 patients, including the diagnosis, operation, Anesthesia, laboratory, and consistent medical care was 425,855 Baht, or an average of 19,802.62 Baht per person. The highest costs were for anesthesia (36.42%), major/minor operations (17.40%), and ICU (8%), respectively.

## Discussion

According to Rampan Pattaranit's study<sup>(9)</sup> which investigated the medical cost of patients with cleft lips aged 4-5 years at Tawanchai Cleft Center, Srinagarind Hospital, it is shown that the highest medical cost was 74,760 Baht. The medical cost per visit was 9,675-13,444 Baht. The highest number of operations was 6 times. The compensation is according to relative weight multiplied by the regional rate payment, which equals 75.75% of the real treatment cost. The average medical cost per person was high because the patients had received treatment since she/he was born and underwent the first operation three times. One patient

received twelve operations within 5 years. Treatment for patients with cleft lips aged 4-5 years used the Evaluation of THAICLEFT 5 year-index, Secondary rhinoplasty, Correction of velopharyngeal insufficiency. Therefore, the medical cost for patients with cleft lips in this study is lower than the previous study.

According to the cost management guidelines of patients with cleft lips, they consist of labor cost and the medical cost in anesthesia. It is stated that the cost management in the hospital should be established as the Best Practice, Cost Per Procedure, Streamlining Work Process, Decreasing Unplanned Activities, and Using technology and decreasing Manual Activities<sup>(6,7)</sup>. It is suggested that guidelines should be established, as a standard for managing material, medicine, and medical supplies in order to increase the effective outcome and decrease medical costs. It is because the main medical cost for patients with cleft lips was the operating cost, which included room service, labor cost, material and equipment, rehabilitating room service, and anesthesia.

### Conclusion

The present study was performed retrospectively. The data were collected by reviewing secondary source information from patients with cleft lips under the Universal Health Coverage Program, who consistently underwent treatment at Tawanchai Cleft Center from the years 2012-2013. According to the cost of medical care of two patients, it was found that the medical cost management of patient No. 1 was 4,429.06 Baht and the charge cost, which was received from the National Health Security Office (NHSO), was 17,941 Baht. So the cost management was lower than the charge cost by 13,511.94 Baht (75.31%). With patient no. 2, the medical cost management was 6,533.43 Baht and the charge cost, which was received from the National Health Security Office (NHSO) was 13,746 Baht. Therefore, the cost management was lower than the charge cost by 7,212.57 Baht (52.47%).

According to the charge cost for 21 patients with cleft lips, the cost, which was received from the National Health Security Office (NHSO), was 252,528 Baht, or an average of 12,025.14 Baht per person. It was found that HNs of the patients were not correct. Therefore, the net of charge, cost which was received from the National Health Security Office (NHSO), was 221,080.24 Baht, an average of 10,527.63 Baht per person. The total cost management was lower than the charge cost by 31,447.76 Baht (87.55%). It was calculated from the DRG rate, which ranged from 7,700-

9,600 Baht multiplied by Adj. Rw.

### Suggestions

Data management of medical care should be completed and corrected in order to use in the cost management effectively. It would be beneficial to identify monetary support such as donations or calling charge costs from the National Health Security Office (NHSO). Moreover, an executive team can acknowledge the precise data in order to make useful decisions in managing other facilities.

### Acknowledgements

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### Potential conflicts of interest

None.

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## แนวทางการจัดการต้นทุนการรักษายาบาลผู้ป่วยปากแหว่งที่ไขสันหลังหลักประกันสุขภาพถ้วนหน้าของศูนย์ตะวันออก โรงพยาบาลศรีนครินทร์ คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น

ชีวารัตน์ อดทน, วีระ อุตริรอด, สุธีรา ประดับวงษ์, บวรศิลป์ เขาวนชื่น

ภูมิหลัง: การศึกษาค้นทุนการรักษายาบาลผู้ป่วยปากแหว่งที่ไขสันหลังหลักประกันสุขภาพถ้วนหน้าของศูนย์ตะวันออก โรงพยาบาลศรีนครินทร์ คณะแพทยศาสตร์ มหาวิทยาลัยขอนแก่น เป็นสิ่งที่ผู้บริหารจำเป็นต้องทราบเพื่อเป็นข้อมูลในการบริหารจัดการองค์กรต่อไป

วัตถุประสงค์: เพื่อศึกษาค่ารักษายาบาลผู้ป่วยปากแหว่งที่ไขสันหลังหลักประกันสุขภาพถ้วนหน้า พร้อมเปรียบเทียบกับรักษายาบาลการรักษาของผู้ป่วยแต่ละรายกับค่าใช้จ่ายที่เรียกเก็บจากสำนักงานหลักประกันสุขภาพแห่งชาติ (สปสช.) และเพื่อเสนอแนวทางการรักษายาบาลให้มีความเหมาะสมต่อองค์กร

วัสดุและวิธีการ: เป็นการศึกษาย้อนหลัง (Retrospective study) ค่ารักษายาบาลของผู้ป่วยปากแหว่งที่เข้ารับการรักษาอย่างต่อเนื่องกับศูนย์ตะวันออก จากแหล่งข้อมูลทุติยภูมิในทัศนะของผู้ให้บริการ (provider) เป็นการประเมินต้นทุนทางบัญชี ซึ่งไม่ได้คำนึงถึงค่าใช้จ่ายส่วนอื่นๆ ของผู้ป่วยโดยการวิเคราะห์เปรียบเทียบรักษายาบาลกับรายได้ที่ได้รับการจัดสรรจากสำนักงานหลักประกันสุขภาพแห่งชาติ (สปสช.) ในระยะเวลา 2 ปี (ระหว่างวันที่ 1 ตุลาคม พ.ศ. 2553 ถึง วันที่ 30 กันยายน พ.ศ. 2555) จำนวน 21 ราย วิเคราะห์ข้อมูลโดยใช้โปรแกรมสำเร็จรูปไมโครซอฟท์ excel ช่วยในการคำนวณต้นทุน

ผลการศึกษา: 1) ต้นทุนที่เกิดขึ้นต่ำกว่าที่เรียกเก็บจริงเนื่องจากไม่ได้รวมต้นทุนค่าห้องผ่าตัด ห้องพักรักษาผู้ป่วย เติงสามัญ และต้นทุนจากการใช้ครุภัณฑ์ทางการแพทย์ เนื่องจากข้อมูลที่เกี่ยวข้องกับราคาอาคารและพื้นที่การใช้งานไม่ชัดเจน และระบบฐานข้อมูลครุภัณฑ์ยังไม่มีคุณสมบัติ 2) ค่ารักษายาบาลรวมเฉลี่ยเท่ากับ 12,025.14 บาทต่อราย แต่เงินชดเชยที่ได้รับจาก สปสช. มีค่าเฉลี่ย 10,527.63 บาท ต่อราย คิดเป็นร้อยละ 87.55 ของค่าใช้จ่ายที่เรียกเก็บทั้งหมดและสัดส่วนค่าใช้จ่ายที่เรียกเก็บสูงสุดคือ ค่าดมยาคิดเป็นร้อยละ 36.42

สรุป: การศึกษารังนี้ชี้ให้เห็นถึงการศึกษาค้นทุนที่ต่ำกว่าความเป็นจริงเนื่องจากความไม่ชัดเจนของข้อมูลในด้านการลงทุนการเรียกเก็บรักษายาบาลจาก สปสช. ได้เพียงร้อยละ 87.55 และสัดส่วนค่าใช้จ่ายที่สูงสุดของรักษายาบาลคือค่าดมยา

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