Chapter 1

Introduction

1.1 Background and Problem Significance

Accidental burnt and scalded is one of the most important public health problem in Thailand. Statistics from the Fire Brigade of the Police Department shows that there were 25,709 fire accidents, caused by fire broke out, short circuit, chemicals, gas leakage, and explosion, with 1,191 death, 2,547 wounded and more than 10 billion Baht of losses during the past 10 years from 1987 to 1996.

Patients with second degree burn, usually suffer from the pain resulting from losses of the epidermis. The patients also face the death risk, due to infection and loss of body fluid, in the case where the burnt goes deep into the subcutaneous layer. Thus, in addition to attentive fluid replacement and respiratory care for the patient during the preliminary phase, it is essential that the wound must be treated with care to prevent infection. The gangrene must be cut out from the wound during the preliminary phase. Skin graft or skin substitute is then used as temporary skin replacement for the wound. There are many methods of therapy for the wound in accidental burnt and scalded patient, in order to prevent infection due to direct air contact and loss of body fluid. Biological dressing, such as the skin from the recently deceased or donor, can also be used to temporarily cover the wound of the patients. These dressing must be frequently replaced, due to refusal reaction from the patients, until the patients' own skin is applied.

The most effective and ideal concept for burn therapy is the autologous skin graft, which use the patients' own healthy remaining skin. The problem arises in the case that if the patients loss more than 60% of his/her total body skin, the remaining skin is not enough for a timely autologous skin graft process, since the patients are not capable of generating new skin from the sparse remaining in order for a prompt treatment.

At present, development in the treatment method for burnt and scalded patients has utilized new study and research technology for skin grafts culturing in the laboratory in order to use them as a permanent skin replacement. This results in the increase of skin quantity for treatment, thus the patients can be more effectively healed, decreasing the pain, infection and death rate. This method involves several complicated processes, hence

increases the cost of treatment and usually carries out on specific burnt and scalded oversea patients only.

In Thailand, especially during this economic downturn, most patients are not treated with this method. But, upon the patients or the patients' relatives requests, it can be done by sending the patients' remaining skin sample oversea in order for culturing in the laboratory, wait until enough graft sheet is achieved, and send back for the treatment. All these processes require long transporting and culturing time, increases cost, and may be untimely, since the patients may die before the graft sheet is due back for treatment.

Due to the fact that the cultured skin graft technique involves several complicated processes, hence increases the cost of treatment, it can be deduced that the cost per patient is high, including cost both for the patient and for the services provider. There has been no study relating to the cost of treatment using the cultured skin graft technique and the result of treatment on the length of stay for an in-patient. It is essential to find out that, if this treatment method can really decrease the length of stay for an in-patient, will the possibility of applying this technique in Thailand be cost effective?

This study uses an economic approach of incremental cost-effectiveness analysis on the use of autologous skin graft technique comparing to cultured skin graft sheet for burnt and scalded patients. No research of this particular characteristic has been done before in Thailand. Therefore, some information used in this study is obtained from oversea in a similar area of medical services study, in order to compares the result on length of stay for in-patients treated with cultured skin graft sheet method.

The result of this study can be used to decide for a treatment option on burnt and scalded patient, since the oversea research finding shows that the use of cultured skin graft sheet method can decrease the length of stay for an in-patient. Consequently, this study provides the information necessary for the decision-maker to decide whether the possibility of applying cultured skin graft technique in Thailand is cost effective.

1.2 Research Objectives

1.2.1 General Objective

To analyze the incremental cost-effectiveness on the use of autologous skin graft technique comparing to cultured skin graft sheet in the services providers' view point.

1.2.2 Specific Objective

1.) To identify the general information relating to cost on the use of autologous skin graft technique comparing to cultured skin graft sheet.

2.) To evaluate the effectiveness in term of length of stay for patient treated with autologous skin graft technique comparing to cultured skin graft sheet.

1.3 Scope of the Research

This study will analyze the incremental cost-effectiveness on the use of autologous skin graft technique comparing to cultured skin graft sheet in the service providers' viewpoint.

This study is a retrospective study on burnt and scalded patients treated in Burn Unit at the Chulalongkorn Hospital for a period of one year, starting from January 1st, 1998 to December 31st, 1998. The study had been done on 27 patients with second degree and third degree burn who were treated with the Autologous skin graft method.

The cost calculation for each method of burnt and scalded treatment comprises of cost for all treated patients (general cost) and cost relating to specific process of each method (specific cost) which are varies and includes capital cost, material cost and labor cost. The summation of all cost equals to the total provider cost for each method of treatment.

Evaluation will be in term of effectiveness. The final analysis will be the incremental cost per incremental outcome.

1.4 Definition

1.) Burnt and scalded patients mean patients suffer from accidental burnt or scalded, without being categorized for the causes of that particular accident, admitted in, at the Burn Unit in the Chulalongkorn Hospital.

2.) Graft means no blood tissue or organ supplies for implantation or transplantation.

3.) Skin graft means: 1. An operation where a doctor attaches donor skin to a burnt area of the body. 2. Segment of dermis and epidermis, which has been completely separated from its blood supply and donor-site attachment before being transplanted to another area of the body or its recipient site.

4.) Autologous skin graft means a procedure in which the donor skin is removed from a patient, and then to be transferred to the original patient.

5.) Donor skin means the skin that is taken from an area of the body that has healthy unburned skin. This skin will replace the burnt skin, which must be cleaned off first.

6.) Cultured skin graft sheet means a product made from patients' tissue sample cultured in the biomaterial laboratory.

7.) Burn Unit or burn center means the section of a hospital especially equipped to treat massive burns.

8.) Costs (the economical cost of production) is the value of manufacturing factors use in the manufacturing of products and services to achieve the final products/output or services in the process of healthcare services for the consumers. This study investigates the cost incurred to the provider.

9.) Capital cost means the depreciation cost of durable and buildings in the hospital.

10.) Labor cost means expenses paid to the employees in return for services rendered, including other monetary fringe benefit such as, wage, salary, and overtime that actually incurred in the year this study is being done.

11.) Material cost means all cost of material that each department withdraw from the dispensing departments, (the major dispensing department of the hospital are the pharmaceutical department, supplies and general administration department) including utility expenses, such as office, technical, and medical supplies, medicine, water and electrical expenses that actually incurred in the year this study is being done.

12.) Medical cost means expenses relating to direct treatment of the patients such as, medicine, examination and other treatment expenses.

13.) Non-medical cost means expenses use in the support of patients treatment, but does not directly incurred from the treatment of the patients. These include, for example, utility and staff salary expenses for the hospital.

14.) Chemical cost means cost of all chemical and solution pertaining to the skin-cells culturing process incurred directly by the bio-material laboratory, for example cell-culturing growth factor.

15.) Incremental cost means cost that varies according to production quantity, for example, the chemical cost use in the laboratory.
16.) Total cost means the summation of capital, material, and labor cost.
17.) Average total cost means the average of total cost per one unit of production, calculates by dividing the total cost by total production units.
18.) Unit cost means the cost per one unit of burnt and scalded patient treatment. The preferred economics unit cost is the average total cost.
19.) Cost-effectiveness means the analysis and appraisal of cost-effectiveness in the form of cost ratio comparison: the effectiveness of different option of process or operation activities under the same environmental condition.
20.) Cost incurred by provider means cost arises to the product or services provider. In this study, the service provider is the hospital, and the services mean treatment of the patient at the particular hospital.
21.) Provider means the hospital that provides treatment for the patients. In this study, the provider is the Chulalongkorn Hospital.

1.5 Research Constraints

The treatment for burnt and scalded patient with cultured skin graft sheet has been done oversea, but not in Thailand. Therefore, some information used in this study is obtained from oversea in a similar area of medical service study, in order to compare the result on length of stay for in-patient treated with cultured skin graft sheet method. The research result from oversea is anticipated to be of minute different.

Cost for cultured skin graft sheet treatment on burnt and scalded patients is approximated from the obtained information used in the calculation of the cost for autologous skin graft treatment.

The retrospective study uses here, has encountered many limitations in collecting all needed information. The information obtained might not be factual which is an impediment of this research.

1.6 Anticipated Benefit

The result of the study on comparative cost-effectiveness between treatment of burnt and scalded patient with autologous skin graft and cultured skin graft sheet will enable us to recognize the information on cost and length of stay for both methods of treatment. Hence, the information from this study might be used to estimate the cost of treatment for each method in the future. In addition, it might also helps the decision-maker in deciding on a more effective method in burnt and scalded patient treatment and decreases the problem of insufficient skin for transplant in Thailand. These, in turn, will influence a more appropriate, economical and beneficial usage of public health resources in the days to come.