Executive Summary

Priority setting of clinical preventive services for benefits extension

Min Jung Ko[1], YunJung Kim[1], Jooyeon Park[1], Ji Hye An[1], Jimin Kim[1], Youngji Baek[1], Young Duk Yun[2], Sun Mi Lee[2]

[1] National Evidence-based Healthcare Collaborating Agency
[2] Health Insurance Policy Research Institute, National Health Insurance Service

□ Introduction

Medical expenses for chronic disease treatment in South Korea has increased from ₩4.8 trillion to ₩17.4 trillion for the last 10 years. It has increased by more than 3.6 times, and has occupied 36.3% of totala medical cost. Considering the fastest entry into the elderly society by the year 2018, aggravation of the death and disease structure by chronic disease and social burden is inevitable. To respond to the structural change towards chronic diseases that will prevail, advanced prevention by strengthening the clinical preventive service is necessary. Thus, actuarial budget for clinical preventive services that is of high necessity and is verified to be effective need to be provided. Although there have been some proposal of recommendation from associated organizations, there has not been any systematic evidence established for educational counseling, preventative medication, and treatment services. In other words, it is necessary to organize clinical preventive service based on evidence, and to review the priority for clinical preventive service.

In this study, we planned to setup the concept and scope for the clinical preventive service, and understand the priority for the insurance payment. Such study was done based on recommendation proposals, grades, and payment status of major countries through paper review and investigation with related organizations. With the above basis, delphi survey was conducted upon professionals for the insurance priority,

evaluation index, and fields of clinical preventive service. Based on the survey results, systematic review was done for clinical effectiveness and cost effectiveness of each clinical preventive service.

□ Scope and concept of clinical preventive services

Preventative health care aims for life extension, disease prevention, and health promotion through regular health inspection, inoculation, counselling, education, training, and many more services. Regular health inspection and inoculation/vaccination are currently being insurance and supported by the government. Thus our study field only focused on counselling, education, preventative medication service, and preventative treatment services.

□ Priority for treatment services

Cost effectiveness, clinical effectiveness, and medical seriousness are considered the utmost priority for treatment services in most of the countries. In previous researches, patient's financial burden, medical seriousness, treatment expense scale, and urgency were considered priority. However, applicable subjects, medical seriousness, and cost effectiveness showed high frequency. Disease scale, disease burden, medical expenses, usage rate, patient compliance, side effects, and harm are considered when prioritizing clinical preventive service in the United States(Maciosek *et al*, 2009). The USPSTF used the idealist standard to take into consideration the clinically preventable burden(CPB) and cost-effectiveness(CE) for relative value estimation (Maciosek *et al*, 2009).

Furthermore, consideration of the priority order and the evaluation index is necessary. Through paper reviews, we came to the conclusion that medical seriousness is evaluated upon the death rate, physical function, clinical effectiveness upon a diseases' death rate, incident rate, clinical value, and cost effectiveness upon cost per Quality-Adjusted Life Years (QALY).

□ Recommendation and payment status for clinical preventive services

In the United States, Australia, and France, when specific subjects are provided clinical preventive services, evidence of benefit and harm are evaluated through previous study reviews. Based on evidence, clinical preventive services are classified into 4 classes (A ~ D). Normally, class A and B can be applied with substantial evidence, while class D shows weakness in the evidence and needs attention when implemented. Preventative medication service for chronic diseases such as cardiovascular disease(CVD) are recommended in the United States. In Australia, lifetime habit counselling is recommended for oral health, falling, nutrition, and diet. France, on the other hand, has high recommendation for counselling on drinking, smoking, and high cholesterol patients. The two clinical preventive services that were above class B in all three countries were drinking and smoking.

Table 1. Recommendation and insurance payment status for clinical preventive service in the three countries

clinical preventive service	Recommendation (calss A or B)			Insurance payment state		
	US	AUS	FRA	US	AUS	FRA
1. Counselling						
drinking (adults)	O	O	O	O	-	-
STI	O	-	-	O	-	-
smoking/nicotine substution therapy	O	O	O	O	O	O
oral heatlh care	O	O	O	O	-	O
injury prvention	-	O	-	-	-	-
fall and physical activity	O	O	-	-	-	-
fat and cholestral diet	-	-	O	-	-	-
nutrition(healthy diet, breast feeding)	O	O	O	O	O	-
2. Preventive drugs						
aspirin for CVD	O	-	-	O	-	-
folic acid supplement	O	O	-	O	O	-
iodide ingestion	-	O	-	-	O	-
newborne conjunctivitis	O	-	-	O	-	-
iron deficient anemia	O	O	-	O	O	-

Insuranced clinical preventive services recommended by USPSTF are mainly educational counselling for drinking, smoking, and the usage of aspirin for CVD prevention. When looking into Australia, insurance are very much provided for supplemental folic acid and iodide for those who plan to get pregnant. In France, the major supports are for the inspection of cancer, as well as oral health treatment education and nicotine replacement therapy. Recommendation and payment status for clinical preventive service in the three countries are shown in Table 1.

Only pediatrics health check and regular health inspections are selected in Korea as clinical preventive service. However, scaling and treatment for dental caries prevention were recently included in the insurance payment as clinical preventive services.

□ Insurance payment priority order and target criteria selection for clinical preventive services (Delphi survey)

To meet the domestic state, 2nd delphi survey was conducted by experts in the insurance and clinical preventive service areas to select 1) priority, 2) evaluation index of priority, and 3) clinical preventive service fields. As a result, it was concluded that clinical effectiveness, cost effectiveness, medical seriousness, target subjects, and public's acceptability were selected in the order as priority. Evaluation index for the priority are as shown in Table 2. clinical preventive service criteria resulted by experts through delphi survey, were drug therapy, educational counselling for smoking, educational counselling for obesity, and nutrition ingestion analysis and education.

Table 2. Priority and evaluation index of priority for clinical preventive service

Rank	Prioirty of Insurance	Evaluation Index
1	Clinical Effectiveness	Clinical Outcome Improvement, Health Habit Practice Compliance Rate
2	Cost Effectiveness	CE ratio, Medical expense, QALY, CB ratio
3	Medical Seriousness	Mortality, Modality, Prevalence, Disability
4	Target Subject	Recommended age population
5	Public Acceptability	Requirement, WTP

As the above table shows, compared to the United States' selection of clinical preventive service, no overlapping other than drinking, supplemental intake, aspirin, and smoking could be seen. Thus through this evaluation we could see that consideration of each domestic state is important in composing the order of priority (Table 3).

Table 3. Comparison of delphi survey results for clinical preventive service field with USPSTF

Clinical preventive service	Delphi survey in korea	Insuranced criterion (or Recommendation calss A or B)			Priority order of PS in the United States (CPB, CE applied)
		US	AUS	FRA	
Educational counselling for smoking	Rank 1	○	○	○	○ (Rank 1)
Drug therapy for smoking	Rank 2	○	○	○	○ (Rank 1)
Educational counseling for obesity	Rank 3	○	X	X	
Educational counselling for nutrition	Rank 4	○	○	○	○ (Rank 7)
Evaluation measurement for obesity	Rank 5				
Educational counseling for drinking	Rank 6	○	○	○	○ (Rank 3)
Nutrition ingestion analysis and education	Rank 7				
Preventive cavity treatment	Rank 8				
Physical education counselling	Rank 9				
Aspirin for cardiovascular disease prevention	Rank 10	○			○ (Rank 1)
Supplemental folic acid ingestion		○	○		○ (Rank 5)
Supplemental calcium ingestion					○ (Rank 4)
Iodide ingestion			○		
Injury prevention education					○ (Rank 6)
Breast feeding counselling		○			
STI counselling		○			
Newborn eye infection preventative treatment		○			
Pediatric iron supplements		○			
Oral health eduction			○		
Fall preventative education			○		

□ Priority development for clinical preventive service for benefit extension

PICO was determined through by professionals about the major fields; educational counselling for smoking and obesity, along with nutritional intake evaluation. Through the systematic review with the PICO, clinical effectiveness and cost effectiveness were assessed. The target subjects were defined by recommended age population that were included in the Korea Health Insurance. Population acceptance rate was presented using the maximum willing to pay (WTP) and other related papers (Table 4).

Table 4. Method of systematic review for major fields selected for clinical preventive services

Criteria	Systematic review									others
	P	I	C	O	SD	selected/excluded number of papar		Final selected paper#		
						1st	2nd	Clinical effectiveness	Cost effectiveness	
Drug therapy for smoking	smoker	NRT, Bupropion, Varenicline	–	clinical-effectiveness or cost-effectiveness	Systematic Review or Economic Evaluation	1,987	100	13	15	major textbooks and guidelines
Eductional couslelling for smloking	smoker, high-risk subject (pregnant women, CVD)	educational counselling				3,734	44	12	1	
Educational counselling for obesity	obese (BMI>25), diabetic, HTN, lipid disorder	educational counselling				652	52	1	4	1st selection papers, and guidelines
Nutrition ingestion assessment	obese (BMI>25), diabetic, HTN, lipid disorder	assessment educational counselling				2	0	0	0	major textbooks and guidelines

I. Insurance of drug therapy and educational counselling for smoking

Target subjects were limited to those who wished to quit, and the usage of drugs were limited to NRT, bupropion, and varenicline for the drug therapy, when reviewing the order of priority.

As a result of systematic review, all three drugs used in the therapy showed to be

clinically effective compared to the placebo. Furthermore, varenicline showed to be the most effective in helping quit smoking when the three drug effects were compared. The result showed to be similar in the cost effective point of view when compared with the placebo drug, and same results were retrieved when the three drugs were compared. In the medical seriousness, smokers showed higher death rate by 1.3 times when compared to non-smokers, and the disease prevalence rate showed to be 2.33 times higher. in year 2014 it is calculated that the number of smokers are 10970000, and those who wish to quit smoking are estimated to be over 650000. According to Ko *et al.* (2013), peoples maximum WTP reached the ₩68000/month, and their wish for personal rate showed to be less than 30%.

Furthermore, smoking counselling showed difference of effectiveness of at least 6 months when compared to normal therapy sessions or no counselling in the clinical point of view. Although specific numbers could not be assessed differing in counselling strength, most papers stated that concentrated counselling showed more effectiveness compared to minimum counselling. Also, quitting rate seemed to be score higher when the counsellor is a medical doctor than a medical service organization, and more effective in CVD patients than pregnant women. One paper that compared the threshold value that of England, stated that compared to normal values of ￡20,000 ~ ￡30,000, the educational counselling reached ￡5,400 which shows to be cost-effective. As such clinical and cost effectiveness seem evident, smoking should be considered thoroughly when insurance expansions are considered in the future.

II. Insurance for educational counselling for obesity

For the systematic review of educational counselling for obesity, such definition was restricted to patients who were diagnosed with obesity (≤ BMI 25kg/m^2), type 2 diabetes, hypertension, and lipid disorder. The educational counselling was restricted to pre-programmed educations by medical doctors and nurses of high professional knowledge. From these group of patients, the (nutritional) counselling group showed weight loss when compared to the non-counselling group or previous treatments.

Although final selection of related papers were restricted to 3 for the analysis of

economic effectiveness, all 3 showed to be cost effective for nutritional counselling.

Consistent result was reported that there was an increase in the death rate and the total treatment cost whilst a decrease in the life-span of obese patients as for the medical seriousness. To estimate the target population, subject diseases' prevalence rate over the age of 30 was implemented on the public's nutritional health research, and resulted in total of 6.66 million.

III. Insurance on nutrition ingestion analysis and education

Nutrition ingestion analysis and education aims to induce appropriate nutritional intake and to prevent complications. Because direct relation with nutrition intake analysis itself could not be found amongst published papers, we were able to comprehend the relationship between the occurrence risk factors and the frequency/ amount/ratio of nutrition intake. Through nutritional analysis we were able to accurately calculate the carbohydrate intake, GI (glycaemic index), GL (glycaemic load), salt intake, as well as fruits and vegetables intake. The quality and the quantity of carbohydrate diet and BMI both have an effect on the occurrence of the metabolic syndrome. Also, the higher the salt intake the higher the RR of stroke and CVD compared to the control group. Furthermore, the intake of raw vegetables showed an inverse ratio relation with both malignant and benign cancers.

The below Table shows evidence for the order of priority per field of clinical preventive services (Table 5).

Table 5. Summary of evidence for clinical preventive service priority

	Rank (delphi survey)	Priority for clinical preventive service					
		clinical effectiveness		cost effectiveness (ICER)	Medical Seriousness	Target Subject	Public Acceptability
Drug therapy and educational counselling for smoking	1/2	smoking cessation rate (>6month) (RR reference control)		*cost-effectiveness - NRT €1,720 - Bupropion: €990 - Varenicline $7,791	Mortality: 1.3 times↑ Prevalence: 2.33 times↑ Disease burden: 11% Medical expenses ₩1.69 trillion	Smokers: 10 million wish to treat: 0.66 million	- WTP : ₩ 25-27 thousand /month - 100% success rate : ₩68,405
		Drug	NRT: 1.53-1.82 Bupropion: 1.39-1.69 Varenicline: 2.09-4.91				
		Counselling	counselling: 1.33~1.82 intensive: 1.20~1.37 physician: 3.49 for CVD: 1.27	*cost-effectiveness (limited) - group counselling : £5,400			
Educational counselling for obesity	3	1 year - weight loss(kg)		*cost-effectiveness (limited) - for overweight, dyslipidemia, diabetes pts $24,481	Mortality: 1.2 times↑ (especially 5~10% weight loss) life times: female 7years, male 5.8years↓ Medical expenses: ₩1.81 trillion	Obesity (≥30 years old) - total: 6.66 million - diabetes: 1.83 million - HTN: 4.14 million - dyslipidemia: 3.82 million	N/A
		significant weight loss in HTN, overweight, dyslipidemia patients					
Nutrition ingestion analysis and education	4/7						

Nutrition	Related disease	Risk
Carbohydrates	Metabolic syndrome	-high carbohydrates intake: OR 6.44 (95% CI 2.16-19.2) -high GI (glycaemic index) OR 10.4 (95% CI 3.24-33.3) -high GL (glycaemic load) OR 6.68(95% CI 2.30-19.4)
Salts	Stroke	high salt intake RR 1.17(95% CI 1.02-1.34, p=0.02)
	CVD	high salt intake RR 1.14(95% CI 0.99-1.32, p=0.07)
Vegetables	Cancer	intake of raw vegetables showed an inverse relationship with cancers (p for trend=0.01)
Fruits		intake of persimmon and tangerine showed an inverse relationship with cancers
Proteins	Chronic renal dysfunction	low protein diet decreased renal dysfunction by more than 40%

□ Conclusions

Priority orders and its evaluation index for future clinical preventive services were studied in this research. As a result, clinical effectiveness, and cost effectiveness were the highest of priority, and the rest were medical seriousness, appliable subjects, and public's acceptance in the written order. Index for the clinical effectiveness were clinical index improvement and health behavior; QALY, CE ratio for cost effectiveness; death rate and prevalence rate for medical seriousness; recommended age of population for applicable subjects; and lastly, requirements for public acceptance. With such base, drug treatment and educational counselling for smoking, educational counselling for obesity, counselling and analysis of nutritional intake are considered the major priorities for the clinical preventive services; especially for smoking.

As the first step towards the extended benefits of clinical preventive services in the future, the analysis of the results has definite limitations. Standard index deriving from current treatment services, it should be acknowledged that such treatments may lack in preventive characteristic.

Furthermore, with limited references and lack of Korea based results, there were definite limitations to standardize the results; especially standardization of educational counselling and limited reference of cost effectiveness evidence. Not only insurance be provided for each services that are of high need and has verified effects, but also should develop disease controlling programs to increase the sustainability of chronic disease controls and support health promotion.

<Keyword>
Clinical preventive service, Benefits extension, Smoking, Obesity, Nutrition