

National Priority Setting of Clinical Practice Guidelines Development for Chronic Disease Management

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INTRODUCTION

As is the case worldwide, the disease burden of chronic disease is continually increasing in Korea (1-3). However, the quality of the treatment and management for chronic diseases remains low (4,5). In particular, the management quality in primary care medicine is at a relatively low level. For example, the rates of measurements of indicators of diabetes complications, such as glycosylated hemoglobin test, lipid profile test, and funduscopic examination, are lower in primary care clinics than in hospital-level facilities (6). Moreover, patient distrust of primary care and distortions of health-care delivery systems have caused many patients with chronic disease to prefer the services of hospital-level institutions (7-9).

As a key strategy for enhancing the management of chronic diseases in primary care clinics, the Korean Academy of Medical Sciences (KAMS) and the Korea Centers for Disease Control and Prevention have been jointly developing clinical practice guidelines (CPGs) for chronic diseases since 2011 (10,11). CPGs for hypertension and diabetes were developed in 2013. Several CPGs for major chronic diseases will continually be developed. In this process, the first step should be deciding priorities. Under the constraint of a limited funding, priority setting and re-

By November 2013, a total of 125 clinical practice guidelines (CPGs) have been developed in Korea. However, despite the high burden of diseases and the clinical importance of CPGs, most chronic diseases do not have available CPGs. Merely 83 CPGs are related to chronic diseases, and only 40 guidelines had been developed in the last 5 yr. Considering the rate of the production of new evidence in medicine and the worsening burden from chronic diseases, the need for developing CPGs for more chronic diseases is becoming increasingly pressing. Since 2011, the Korean Academy of Medical Sciences and the Korea Centers for Disease Control and Prevention have been jointly developing CPGs for chronic diseases. However, priorities have to be set and resources need to be allocated within the constraint of a limited funding. This study identifies the chronic diseases that should be prioritized for the development of CPGs in Korea. Through an objective assessment by using the analytic hierarchy process and a subjective assessment with a survey of expert opinion, high priorities were placed on ischemic heart disease, cerebrovascular diseases, Alzheimer's disease and other dementias, osteoarthritis, neck pain, chronic kidney disease, and cirrhosis of the liver.

Keywords: Clinical Practice Guideline; Chronic Disease; Primary Health Care; Health Priorities; Korea

source allocation are required. Moreover, the fair selection of subjects, on the basis of evidence, is of fundamental importance to promote the development of CPGs and encourage the applications for guidelines in clinical fields (12).

Prioritization is a systematic approach to allocating resources for creating the "best" health-care system, subject to a variety of demands and limited resources (13,14). In addition, another strategy is to focus public attention and capabilities on key health issues (15). In decision making in complex health-care situations, a "reasonable side" and an "intuitive side" can be considered simultaneously when prioritizing alternatives for multiple criteria (16,17).

By establishing a special committee for priority setting and surveying objective and subjective assessments, this study identifies the chronic diseases that need to be prioritized in the development of CPGs in Korea.

MATERIALS AND METHODS

Overall process

The prioritization was performed as follows (Fig. 1): i) creating the CPG Priority-Setting Committee with representatives of 26 medical associations and CPG experts, ii) identifying the target

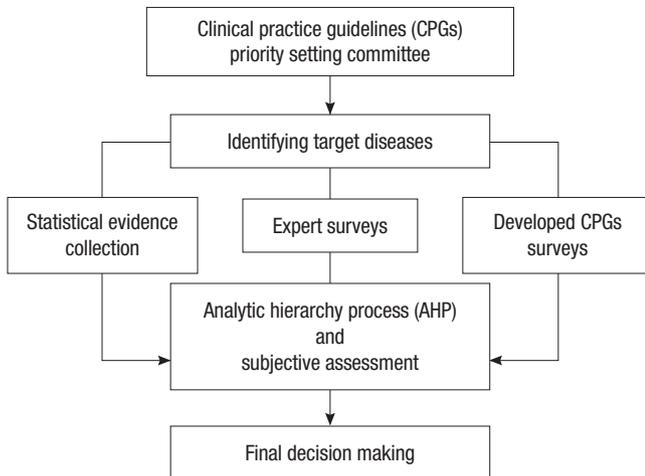


Fig. 1. Framework of CPGs priority setting.

chronic diseases, iii) collecting statistical data on those chronic diseases and examining the current developmental status of CPGs in Korea, iv) surveying the opinions of experts from the CPG Priority-Setting Committee by using the analytic hierarchy process (AHP) and a subjective assessment, and v) determining final priorities.

The CPG Priority-Setting Committee

The CPG Priority-Setting Committee was composed of experts representing the users and developers of CPGs. There were 36 members including primary care physicians from the Korea Medical Practitioners Association representing the end user, members of the CPG committee of KAMS, and experts on the methods of guideline development.

Identifying target chronic diseases

The prioritized targets among the chronic diseases were extracted by using the Global Burden of Disease (GBD) and the 2012 Health Insurance Statistics Yearbook (18). The GBD classifies the diseases and injuries into 291 causes, whereas the International Statistical Classification of Diseases and Related Health Problems 10th revision (ICD-10) classifies 22 classes, 267 categories, and 2093 subcategories. Among the 144 causes, those classified as noncommunicable diseases in the GBD were selected and matched with the ICD-10 categories. However, neoplasm, oral disorders, and hypertension and diabetes (the diseases for which CPGs are currently being developed by KAMS) were excluded. Finally, 41 chronic diseases were selected. Those diseases are the prioritized targets of this study.

Collection of statistical evidence and surveys of already developed CPGs

Prioritization in the development of CPGs for chronic diseases could provide standards for the fair distribution of resources in order to decrease the social burden of those diseases. There-

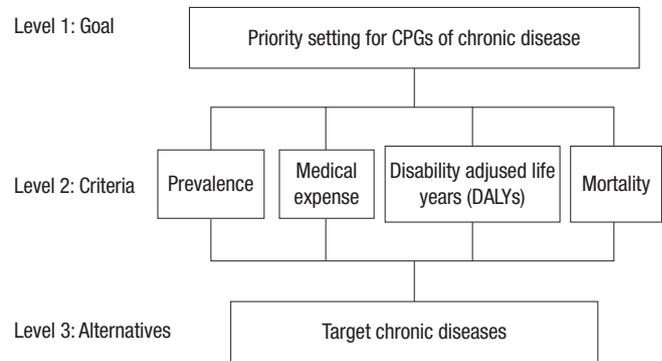


Fig. 2. Analytic hierarchy process (AHP) model of the study.

fore, to reflect the impact of a chronic disease on the judgment of priority, condition-level criteria focused on the burden of the disease were selected (19). Four criteria were considered: prevalence rate, mortality, medical expenses, and disability-adjusted life years (DALYs). Statistical data for the numbers of patients and medical expenses of disease-specific ICD-10 codes by categories were extracted from the Health Insurance Statistics Yearbook. The mortality rate was extracted from the database of the National Statistical Office of Korea. DALYs were extracted, according to cause, from the GBD. The prevalence rate was applied to the number of patients as a proxy indicator. All data were normalized by using the z-score to enhance the comparativeness between the criteria. To identify the current developmental status of CPGs in Korea, a mail survey to 133 affiliated medical associations was conducted through KAMS. Data on the burden of disease and a list of available CPGs were provided to the committee for consideration in the prioritization process.

Expert surveys

The expert survey was performed in 2 ways: objective measurement methods with the AHP (objective assessment) and asking about subjective priorities for CPG development (subjective assessment). AHP is a multicriteria analysis performed to determine priority by classes after classifying the criteria. This method consisted of 4 steps. The first step was to create a decision model (20,21). The AHP in this study comprised 3 levels (Fig. 2). Level 1 involved the ultimate goal of the AHP; that is, the ranking of chronic diseases for which there is a need to develop CPGs. Level 2 involved the 4 criteria to be considered when CPGs are chosen for chronic diseases. We would have also liked to include variability as a criterion; however, we could not find data to clarify the current situation in Korea. Therefore, the developmental status of CPGs was surveyed instead of the variability. Level 3 involved identifying the 41 target chronic diseases. The AHP analysis model in this study is described below.

The second step was to determine the relative priorities of the criteria by making a series of pairwise comparisons among them with Saaty's discrete 7-value scale method (20). The third

Table 1. Target chronic diseases and disease burden by criteria

No.	Chronic diseases	ICD-10	Prevalence		Medical expense		DALYs		Mortality	
			N	Z	USD	Z	%	Z	R	Z
1	Dyslipidemia	E78	1,289,569	0.117	211,564,279	-0.213	0.41	-0.432	1.20	-0.285
2	Alzheimer's disease and other dementias	F00, F01, F03, G30	354,272	-0.437	1,039,685,226	2.039	1.50	0.247	8.50	0.511
3	Alcohol use disorders	F10	75,925	-0.601	216,835,500	-0.199	1.87	0.477	1.40	-0.264
4	Schizophrenia	F20	102,186	-0.586	316,926,954	0.073	1.32	0.137	0.20	-0.394
5	Unipolar depressive disorders	F31-F34	728,867	-0.215	344,114,338	0.147	3.39	1.432	0.00	-0.416
6	Anxiety disorders	F40, F41, F43, F45, F48	877,848	-0.127	159,489,986	-0.355	2.36	0.786	0.00	-0.416
7	Parkinson's disease	G20	79,930	-0.599	269,122,301	-0.057	0.22	-0.551	6.30	0.271
8	Epilepsy	G40	133,562	-0.567	104,390,909	-0.505	0.48	-0.389	0.90	-0.318
9	Migraine	G43, G44	1,085,399	-0.004	97,356,396	-0.524	2.37	0.792	0.00	-0.416
10	Cataracts	H25, H26	1,164,780	0.043	457,299,954	0.455	0.11	-0.619	0.00	-0.416
11	Glaucoma	H40	635,019	-0.271	106,562,609	-0.499	0.04	-0.664	0.00	-0.416
12	Refraction and accommodation disorders	H50, H52	2,420,915	0.786	107,539,218	-0.496	0.08	-0.642	0.00	-0.416
13	Other vision loss	H53	75,897	-0.601	6,891,870	-0.770	0.43	-0.419	0.00	-0.416
14	Ischemic heart disease	I20, I25	164,697	-0.549	120,044,714	-0.462	3.90	1.745	26.80	2.506
15	Cardiomyopathy and myocarditis	I42	28,418	-0.630	38,388,516	-0.684	0.20	-0.569	2.90	-0.100
16	Atrial fibrillation and flutter	I47-I49	283,502	-0.479	157,156,111	-0.361	0.18	-0.578	10.10	0.685
17	Hypertensive heart disease	I50	115,070	-0.578	96,876,874	-0.525	0.55	-0.042	8.10	0.467
18	Cerebrovascular disease	I60, I61, I63, I65, I67, I69	778,628	-0.186	664,450,614	1.019	6.85	3.592	50.30	5.068
19	Peripheral vascular disease	I70, I73	99,478	-0.588	13,739,450	-0.751	0.04	-0.666	0.40	-0.373
20	COPD	J44	219,522	-0.516	133,757,481	-0.425	1.62	0.325	9.70	0.641
21	Asthma	J45, I46	1,877,132	0.465	242,414,169	-0.129	1.07	-0.024	3.00	-0.089
22	GERD	K21	3,519,136	1.436	364,589,088	0.203	0.37	-0.457	0.20	-0.394
23	Peptic Ulcer Disease	K25, K26, K27	1,981,239	0.526	234,931,738	-0.150	0.18	-0.578	0.90	-0.318
24	Gastritis and duodenitis	K29	5,537,390	2.631	337,765,932	0.130	0.06	-0.655	0.10	-0.405
25	Cirrhosis of the liver	K70, K71, K73, K74	381,576	-0.421	219,602,288	-0.191	2.54	0.897	13.20	1.023
26	Gall bladder and bile duct disease	K80-K82	205,448	-0.525	249,642,483	-0.110	0.19	-0.573	0.90	-0.318
27	Urticaria	L50	2,438,071	0.796	117,628,575	-0.469	0.17	-0.583		-0.416
28	Rheumatoid arthritis	M05, M06	282,061	-0.479	156,199,090	-0.364	0.60	-0.316	0.40	-0.373
29	Gout	M10	292,185	-0.473	48,854,668	-0.656	0.01	-0.684	0.10	-0.405
30	Osteoarthritis	M15-M17, M19, M24, M25	5,132,022	2.391	1,264,330,619	2.650	1.49	0.238	0.00	-0.416
31	Low back pain	M40, M41, M45-M49	2,696,010	0.949	781,263,369	1.336	5.90	2.997	0.30	-0.384
32	Neck pain	M50-M54	7,669,057	3.892	1,411,443,671	3.050	3.18	1.298	0.00	-0.416
33	Tubulointerstitial nephritis, pyelonephritis, urinary tract infections	N02, N13	75,221	-0.602	28,200,950	-0.712	0.11	-0.620	0.20	-0.394
34	Chronic Kidney Disease	N18	150,862	-0.557	1,341,916,546	2.861	1.02	-0.051	6.60	0.303
35	Urolithiasis	N21	33,251	-0.627	7,691,439	-0.767	0.05	-0.659	0.00	-0.416
36	Other urinary diseases	N28, N31, N32	388,426	-0.417	60,269,087	-0.625	0.06	-0.656	0.00	-0.416
37	Benign prostatic hyperplasia	N40	974,458	-0.070	287,746,721	-0.006	0.36	-0.465	0.00	-0.416
38	Male infertility	N46	42,858	-0.621	2,751,215	-0.781	0.01	-0.687	0.00	-0.416
39	Endometriosis	N80	84,455	-0.596	41,645,769	-0.675	0.04	-0.667	0.00	-0.416
40	Premenstrual syndrome	N94	159,854	-0.552	5,086,714	-0.775	0.08	-0.644	0.00	-0.416
41	Female infertility	N97	147,078	-0.559	20,289,735	-0.733	0.00	-0.688	0.00	-0.416

ICD, international statistical classification of diseases and related health problems; N, numbers; Z, z-score; 1 USD, 1,000 Korean won; %, percent of total DALYs in Korea; R, number of deaths per 100,000.

step was to calculate the geometric mean of each criterion in the matrix to obtain an approximate eigenvector that is the weighted value of the 4 criteria. Finally, the fourth step was to apply the weighted values to the standardized status (the z-score) of the 41 diseases. Consequently, the final prioritized

diseases were determined.

On the other hand, the subjective assessment was performed by asking about subjective priorities for CPG development. Each disease was evaluated on a 7-point scale in terms of priority for CPG development, and the priority order was selected by

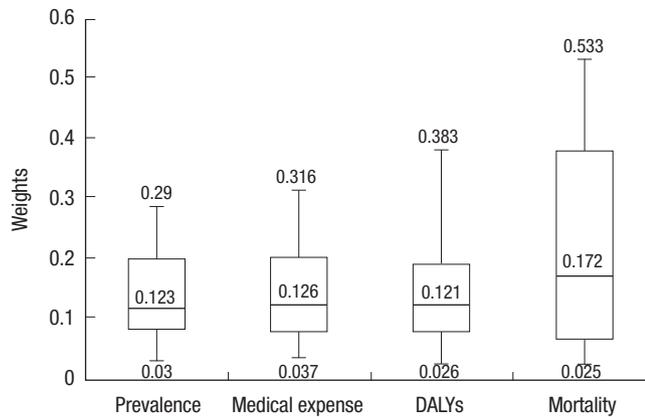


Fig. 3. Distributions of weights according to AHP criteria. The top and bottom of the box indicates the 75th (Q3) and 25th percentile (Q1), respectively, and the horizontal line in the box means the 50th percentile (the median). The upper and lower ends of the whisker represent maximum and minimum, respectively.

summing the scores from the evaluators. The experts ranked the priorities by disease, excluding those diseases in their medical field. Therefore, the results were unaffected by the specific interests of expert societies.

Final decision making

The top 20 diseases that received high priority ratings through the AHP and as suggested by subjective assessment each were selected.

RESULTS

Target diseases and burden of disease

The 41 chronic diseases, their ICD-10 codes, and the burden of diseases are described in Table 1. Musculoskeletal diseases such as neck pain and osteoarthritis show a high prevalence and confers high medical expense but have low mortality rates. Although low in prevalence, cerebrovascular diseases present high DALY rates and high mortality.

Prioritizing by expert survey

Of the members of the CPG Priority-Setting Committee, 36 were surveyed with the AHP. Of them, 22 answered (61.1% response rate). The AHP assessment showed that among the criteria for measuring the burden of disease, high importance was placed on mortality and medical expenses (Fig. 3).

In both the AHP and subjective assessments, 7 diseases received an equal high priority: ischemic heart disease, cerebrovascular diseases, Alzheimer's disease and other dementias, osteoarthritis, neck pain, chronic kidney disease, and cirrhosis of the liver. The AHP showed that cerebrovascular diseases had the highest priority for CPG development; cardiovascular diseases such as ischemic heart disease and dyslipidemia were also ranked highly. The priority level of musculoskeletal disor-

Table 2. Priorities in chronic diseases for the development of CPGs by AHP and subjective assessment

Rank	AHP	Subjective assessment
1	Cerebrovascular disease	Ischemic heart disease
2	Neck pain	Cerebrovascular disease
3	Low back pain	Alzheimer's disease and other dementias
4	Osteoarthritis	Dyslipidemia
5	Ischemic heart disease	Asthma
6	Chronic Kidney Disease	Osteoarthritis
7	Alzheimer's disease and other dementias	COPD
8	Gastritis and duodenitis	Neck pain
9	Cirrhosis of the liver	Chronic Kidney Disease
10	Unipolar depressive disorders	Cirrhosis of the liver
11	GERD	Benign prostatic hyperplasia
12	Asthma	Cataracts
13	COPD	Parkinson's disease
14	Anxiety disorders	Unipolar depressive disorders
15	Migraine	Low back pain
16	Atrial fibrillation and flutter	Peptic Ulcer Disease
17	Peptic Ulcer Disease	Alcohol use disorders
18	Cataracts	Schizophrenia
19	Alcohol use disorders	GERD
20	Urticaria	Gastritis and duodenitis

AHP, analytic hierarchy process; GERD, gastroesophageal reflux disease; COPD, chronic obstructive pulmonary disease.

ders, such as neck pain, low back pain, and osteoarthritis, was also high. The subjective assessment showed that cardiovascular diseases such as ischemic heart disease, cerebrovascular diseases, and dyslipidemia had high rankings. The top 20 diseases that received a high priority are shown in Table 2.

DISCUSSION

Recently, CPGs in various areas have been developed through the voluntary efforts of academic societies. However, despite the high burden of diseases and the clinical importance of CPGs, several major chronic diseases do not have CPGs (22,23). Moreover, some of the many CPGs that have been developed already require revision. By November 2013, there were 141 CPGs in Korea (see Table S1). If the first edition of a CPG and its revised version are counted as 1, there are now 125 CPGs that have been developed by 76 academic societies or institutions in Korea. Of them, 83 CPGs are related to chronic diseases. Moreover, among those CPGs for chronic diseases, 40 guidelines had been developed in the last 5 yr (since 2010). Considering the rate of the production of new evidence in medicine and the worsening of the burden of chronic diseases, the need for developing more CPGs for chronic diseases is becoming increasingly pressing.

Among the criteria used to measure the burden of disease with the AHP, medical expenses and mortality were considered of high importance. Diseases with a high burden, such as cerebrovascular diseases, ischemic heart disease, musculoskeletal disease, and dyslipidemia, received high rankings that indicate the need for the development of CPGs.

Cerebrovascular diseases and ischemic heart disease are serious causes of death in Korea, and the medical expenses and numbers of patients with these diseases are very high. Furthermore, when the major risk factors—hypertension and diabetes—are considered, the disease burden becomes even greater (24). However, among the guidelines developed since 2010, only 13 have targeted cerebrovascular diseases and only 2 have a focus on ischemic heart disease. Furthermore, unfortunately, although many CPGs have been developed in recent years, they have focused on use in tertiary hospital institutions. CPGs reflecting the clinical features in primary care, the values and preferences of patients, and the environment of primary care institutions for the management of chronic diseases are insufficient. CPGs for disease prevention, lifestyle management, and follow-up care after the acute period of disease should be developed. For example, CPGs about primary and secondary prevention, screening, mild stable angina management, and indications for referring to tertiary institutions would be useful.

The situation for musculoskeletal disorders is even more serious. To date, despite the high burden of musculoskeletal disease, only 2 of such diseases—osteoporosis and rheumatoid arthritis—have CPGs in Korea. Given the high level of disease burden and the high variability in the behavior of health-care providers in musculoskeletal disorders (25), the development of more CPGs is urgently required. In addition, there is a pressing need for the development of guidelines on dementia, chronic renal failure, liver disease, asthma, and chronic obstructive pulmonary disease. Owing to the increase in the elderly population, the prevalence of dementia continues to increase (26). However, there is only one guideline related to dementia, which was developed in 2009, and it only covers disease diagnosis. Thus, the development of new guidelines for dementia is urgently needed, for application in various areas, including a set of detailed services about the prevention of disease, behavioral intervention, and pharmacological therapy, among others.

Moreover, the CPGs to be developed for those diseases are also expected to be consistent with national policies, in which the importance of cerebrovascular diseases, ischemic heart disease, and dementia has been increasing consistently. Those diseases are the main targets of “Health Plan 2020,” and risk factors such as smoking, drinking, exercise, and nutrition are the subjects of active management in the National Cerebrovascular Management Project, based on the National Health Promotion Act (27). In the case of dementia, the Dementia Management Act was enacted in 2012 and provides a legal foundation for prevention, early detection, and follow-up. Moreover, a dementia-screening program is being implemented throughout the country as a national policy. Furthermore, since the introduction of long-term care insurance, the frequencies of diagnosis, treatment, and care management by primary care physi-

cians have increased (28). However, there is as yet no guideline for these physicians, which makes it difficult to provide appropriate services.

In this study, we found a high need for CPGs for chronic diseases in Korea. Considering the rate of the production of new evidence in medicine and the worsening of the burden from chronic diseases, the need for developing more CPGs for more chronic diseases is becoming increasingly pressing.

In most countries with advanced CPG development, the establishment of public-private partnerships (PPPs) has been emphasized to develop the most reliable guidelines at a high level. Furthermore, this ensures the participation of various stakeholders in the development of CPGs and their quality control, leading to a social consensus for any conflict resolution caused by the CPGs (29,30). The United States has mandated the use of PPPs in developing CPGs (31). In Australia, the principles of development and a social consensus about the legal status of CPGs have been developed jointly by medical societies and the government (32). In Korea, however, most of the developmental activities depend on professionals. KAMS has led the development of CPGs, whereas the government’s role has been confined to providing financial support. To develop high-quality CPGs, and to enhance implementation in practice, collaboration between professionals and the government is essential. PPP for financing, granting official status to accredited CPGs, and creating a favorable environment for implementation could lead to the development of CPGs with high quality.

DISCLOSURE

The authors have no potential conflicts of interest to disclose.

AUTHOR CONTRIBUTION

Design of the study: Jo HS, Oh MK. Data collection and analysis: Oh MK. Writing manuscript: Jo HS, Kim DI, Oh MK. Revision: Kim DI. Approval of approved final version of this manuscript: all authors.

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Table S1. One hundred forty-one CPGs lists developed since 1998 (as November 2013) in Korea

Year	Clinical practice guidelines	Developer
2013	1) Guidelines for the Diagnosis and Treatment of Helicobacter pylori Infection in Korea, 2013 revised edition*	Korean College of Helicobacter and Upper Gastrointestinal Research
	2) Guidelines for Nutritional Support in the Intensive Care Unit	Korean Society of Critical Care Medicine
	3) Clinical Practice Guidelines for Stroke	Clinical Research Center for Stroke
	4) Clinical Practice Guidelines for Stroke-Primary Prevention: Unruptured Intracranial Aneurysm	
	5) Clinical Practice Guidelines for Stroke-Primary Prevention: Atrial Fibrillation	
	6) Clinical Practice Guidelines for Stroke-Acute Stroke Management: Thrombolysis	
	7) Guideline for Appropriate Use of Cardiac CT in Heart Disease	Korean Society of Radiology Korean Society of Cardiology
	8) Global IDF/ISPAD Guideline for Diabetes in Childhood and Adolescence: Korean edition	Korean Society of Pediatric Endocrinology
	9) Guidelines for Hypertension 2013*	Korean Society of Hypertension
	10) Guideline for Primary Prevention of Cardio-Cerebrovascular Disease	Korean Academy of Family Medicine
	11) Prevention and Treatment of Metabolic Syndrome for Adult in Korea	
	12) Guideline on Upper Gastrointestinal Endoscopy for Primary Care Physician	
	13) Clinical Practice Guideline: Management of Hepatitis B*	Korean Association for The Study of The Liver
	14) Clinical Practice Guideline: Management of Non-Alcoholic Fatty Liver Disease	
	15) Clinical Practice Guideline: Management of Alcoholic Liver Disease	
	16) Treatment Guidelines for Acute Asthma Attack*	Clinical Research Center for Chronic Obstructive Airway Disease Korean Academy of Asthma, Allergy and Clinical Immunology
	17) Guidelines for Treatment with Disease Modifying Anti-Rheumatic Drugs in patients with Rheumatoid Arthritis	Korean Rheumatism Association Clinical Research Center for Rheumatic Arthritis
	18) Guideline for Treatment with Biologic Agents in patients with Rheumatoid Arthritis	
	19) Guideline for Treatment with Glucocorticoid in patients with Rheumatoid Arthritis	
	20) Guideline for management of Cardiovascular Risk in patients with Rheumatoid Arthritis	
	21) Guideline for Diagnosis and Assessment of Depression 2013*	Clinical Research Center for Depression
	22) Physician's Guide for Diagnosis and Treatment of Osteoporosis 2013*	Korean Society of Bone Metabolism
2012	23) Classification Criteria for Rheumatoid Arthritis	Korean Rheumatism Association Clinical Research Center for Rheumatic Arthritis
	24) Guidelines on Urinary Incontinence	Korean Continence Society
	25) Clinical Practice Guideline for Allergic Rhinitis*	Korean Society of Otorhinolaryngology-Head and Neck Surgery Korean Rhinology Society
	26) Korean Guideline for the Management of Gastroesophageal Reflux Disease*	Korean Society of Neurogastroenterology and Motility Korean College of Helicobacter and Upper Gastrointestinal Research
	27) Cancer Pain Management Guideline	Korean Society for Hospice and Palliative Care
	28) Korean Medication Guidelines for the Treatment with Depressive Disorder*	Korean Society for Depressive and Bipolar Disorders Korean College of Neuropsychopharmacology
	29) Guidelines of Vaccination for Adult in Korea*	Korean Academy of Family Medicine
	30) Guidelines for Antiplatelet Therapy on Acute Coronary Syndrome	Korean Society of Cardiology Clinical Research Center for Ischemic Heart Disease
	31) Clinical Guidelines for the Treatment and Prevention of Opportunistic Infections in HIV infected Koreans	The Korean Society for AIDS
	32) Clinical Practice Guidelines for the Management of Bacterial Meningitis in Adults in Korea	Korean Society of Infectious Diseases Korean Society for Chemotherapy The Korean Orthopaedic Association The Korean Neurosurgical Society The Korean Dermatologic Association
	33) Clinical Practice Guidelines for Soft Tissue Infections	Korean Society of Infectious Diseases Korean Society for Chemotherapy The Korean Neurological Association The Korean Neurosurgical Society Korean Society of Clinical Microbiology
	34) Clinical Guidelines for the Antimicrobial Treatment of Bone and Joint Infections in Korea	Korean Society of Infectious Diseases Korean Society for Chemotherapy Korean Orthopedic Association
	35) Guidelines on Management of Gastric Cancer	Clinical Research Center for Solid Tumor in Adults

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Table S1. Continued

Year	Clinical practice guidelines	Developer
	36) Guidelines for the Management of Crohn's Disease	Korean Association for the Study of Intestinal Diseases
	37) Guidelines for the Management of Ulcerative Colitis	
	38) Clinical Practice Guideline for CAPD peritonitis	Clinical Research Center for End Stage Renal Disease Korean Society of Nephrology
	39) Korean Evidence Based Medication Guideline for Depression, revised*	Clinical Research Center for Depression
	40) Practice Guidelines for the Early Detection of Cervical Cancer in Korea	Korean Society of Gynecologic Oncology Korean Society of Obstetrics and Gynecology Korean Society for Cytopathology
	41) Clinical Practice Guidelines for Stroke-Secondary Prevention: Other antiplatelet agents: Triflusal, Dipyridamole, Cilostazol	Clinical Research Center for Stroke
	42) Korean Guideline for Attention-Deficit Hyperactivity Disorder	Korean Child Neurology Society
	43) Clinical Practice Guideline for Antiviral Treatment and Chemoprophylaxis of Seasonal Influenza	Transgovernmental Enterprise for Pandemic Influenza in Korea
	44) COPD Clinical Practical Guideline revised 2012	Korean Academy of Tuberculosis and Respiratory Diseases
	45) Korean Clinical Practice Guideline for Gastric Cancer	Korean Academy of Medical Sciences
	46) Clinical Practice Guideline for Stroke Rehabilitation in Korea 2012	Korea Society for NeuroRehabilitation
2011	47) Guidelines for Childhood Urinary Tract Infection	Korean Society of Pediatric Nephrology
	48) Guidelines on Overactive Bladder	Korean Continence Society
	49) Guidelines on Neurologic Bladder	
	50) Guidelines for the Treatment of Functional Dyspepsia	Korean Society of Neurogastroenterology and Motility Korean College of Helicobacter and Upper Gastrointestinal Research
	51) Korean Guideline for the Management of Gastroesophageal Reflux Disease†	
	52) Guidelines for the Treatment of Irritable Bowel Syndrome	
	53) Guidelines for the Treatment of Constipation	Korean Society of Neurogastroenterology and Motility
	54) Treatment Guidelines for Diabetes 2011*	Korean Diabetes Association
	55) Physician's Guide for Diagnosis and Treatment of Osteoporosis 2011†	Korean Society of Bone Metabolism
	56) Korean Guidelines for Tuberculosis	Korean Academy of Tuberculosis and Respiratory Diseases Korean Society for Chemotherapy
	57) Clinical Practice Guideline: Management of Hepatitis B†	Korean Association for The Study of The Liver
	58) Clinical Practice Guideline for Liver Cirrhosis, Update	Korean Association for The Study of The Liver Liver Cirrhosis Clinical Research Center
	59) Korean Treatment Guideline for Atopic Dermatitis	Korean Dermatological Association
	60) Clinical Guideline for the Diagnosis and Treatment of Urinary Tract Infections: Asymptomatic Bacteriuria, Uncomplicated and Complicated Urinary Tract Infections, Bacterial Prostatitis	Korean Society of Infectious Diseases Korean Society for Chemotherapy Korean Association of Urogenital Tract Infection and Inflammation
	61) Clinical Guideline for the Diagnosis and Treatment of Cardiovascular Infections	Korean Society of Clinical Microbiology Korean Society of Infectious Diseases Korean Society for Chemotherapy Korean Society of Clinical Microbiology Korean Society of Cardiology Korean Society for Thoracic and Cardiovascular Surgery
	62) Evidence-based Guidelines for Empirical Therapy of Neutropenic Fever in Korea	Korean Society of Infectious Diseases Korean Society for Chemotherapy Korean Cancer Association Korean Society of Clinical Microbiology Korean Society of Hematopoietic Stem Cell Transplantation Korean Society of Hematology Korean Association for Clinical Oncology
	63) Clinical Guidelines for the Diagnosis and Treatment of HIV/AIDS in HIV-infected Koreans	The Korean Society for AIDS
	64) Guidelines for Management of Endometriosis	Korean Society of Obstetrics and Gynecology
	65) Guideline for Insulin Treatment and Glycemic Control in Patients with Type 2 Diabetes Mellitus	Clinical Research Center for Type 2 Diabetes
	66) Korean Asthma Management Guideline for Adults†	Clinical Research Center for Chronic Obstructive Airways Disease
	67) Mechanical Ventilation in Chronic Obstructive Airways Disease: Korean Guideline, Revised	
	68) Aspirin Primary Stroke Prevention	Clinical Research Center for Stroke
	69) Clinical Practice Guidelines for Stroke-Primary Prevention: Asymptomatic Stenosis for Primary Stroke Prevention	
	70) Extracranial Carotid Artery Stenosis	

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Table S1. Continued

Year	Clinical practice guidelines	Developer
	71) Guidelines for Percutaneous Coronary Intervention in patients with Left Main Coronary Artery Disease	Clinical Research Center for Ischemic Heart Disease
	72) Guidelines for Reperfusion Therapy on Chronic Stable Angina	Korean Society of Cardiology Clinical Research Center for Ischemic Heart Disease
	73) Clinical Guidelines for Precocious Precocity 2011	The Korean Society of Pediatric Endocrinology
2010	74) Guideline for management of heavy menstrual bleeding	Korean Society of Obstetrics and Gynecology
	75) Clinical Practice Guideline for Non-Small Cell Lung Cancer	Korean Association for the Study of Lung Cancer
	76) Clinical Practice Guideline for Otitis Media with Effusion	Korean Society of Otorhinolaryngology-Head and Neck Surgery
	77) Korean Medication Guidelines for the Treatment with Bipolar Disorder Patients	Korean College of Neuropsychopharmacology Korean Society for Depressive and Bipolar Disorders
	78) Korean Clinical Practice Guideline : Otitis Media in Children 2010	Korean Otologic Society Korean Pediatric Society
	79) Practical Guidelines for Management of Gallbladder Polyps	Korean Association of Hepato-Biliary-Pancreatic Surgery
	80) Guidelines of Vaccination for Adult in Korea [†]	Korean Academy of Family Medicine
	81) Clinical Guidelines on Urothelial Cancer	Korean Urological Association
	82) Clinical Guidelines on Benign Prostatic Hyperplasia	Korean Prostate Society
	83) Clinical Guideline for the Diagnosis and Treatment of Gastrointestinal Infections	Korean Society of Infectious Diseases Korean Society for Chemotherapy Korean Society of Clinical Microbiology
	84) Practice Guideline for Gynecologic Cancer	Korean Society of Obstetrics and Gynecology
2009	85) Treatment Guidelines for Community-acquired Pneumonia in Korea*	Korean Academy of Tuberculosis and Respiratory Diseases Korean Society for Chemotherapy Korean Society of Infectious Diseases
	86) Guidelines of Diagnosis for Peptic Ulcer Disease	Korean College of Helicobacter and Upper Gastrointestinal Research Korean Society of Gastroenterology
	87) Guidelines of Treatment for Non-bleeding Peptic Ulcer Disease	
	88) Guidelines of Treatment for Bleeding Peptic Ulcer Disease	
	89) Guidelines of Prevention and Treatment for NSAID-related Peptic Ulcer	
	90) Guidelines of Treatment for Peptic Ulcer Disease in Special Condition	Korean College of Helicobacter and Upper Gastrointestinal Research
	91) Diagnostic Guideline of Ulcerative Colitis	
	92) Diagnostic Guideline of Crohn's Disease	
	93) Diagnostic Guideline of Intestinal Tuberculosis	
	94) Diagnostic Guideline of Behcet's Disease	
	95) Treatment Guidelines for Dyslipidemia	Korean Society of Lipidology
	96) Guidelines for the Diagnosis and Treatment for Helicobacter pylori infection in Korea [†]	Korean Society of Gastroenterology
	97) Clinical Practice Guideline for the Management of Sedation and Pain in ICU for Adults	Korean Society of Critical Care Medicine
	98) Treatment Guidelines for Stable Angina, Revised*	Korean Society of Cardiology Clinical Research Center for Ischemic Heart Disease
	99) Clinical Practice Guideline for Dementia Part I: Diagnosis & Evaluation	Clinical Research Center for Dementia
2008	100) Guidelines for Herpes Zoster and Postherpetic Neuralgia	Korean Society of Anesthesiologists
	101) Perioperative Management for the patients with Anticoagulant	
	102) Guidelines for Management of Difficult Airway	
	103) Korean Guideline for Chronic Pancreatitis	Korean Pancreatobiliary Association
	104) Clinical Practice Recommendations for Breast Cancer	Korean Breast Cancer Society
	105) Guidelines for Measuring the Intima-Media Thickness in Diabetes	Clinical Research Center for Type 2 Diabetes
	106) Guidelines for Diabetes Education	
	107) Guidelines for Weight Control in patients with Type 2 Diabetes Mellitus	
	108) Guidelines for Health Behavior in patients with Type 2 Diabetes Mellitus	
	109) Korean Clinical Practice Guideline of Depressive Disorder 2008 [†]	Korean Academy of Medical Sciences Korean Neuropsychiatric Association Korean Society for Depressive and Bipolar Disorders Korean College of Neuropsychopharmacology
	110) Evidence Based Medicine Guideline for Posttraumatic Stress Disorder	Korean College of Neuropsychopharmacology Korean Academy of Anxiety Disorder
2007	111) Blood Pressure Monitoring Guidelines	Korean Society of Hypertension
	112) Guidelines for Childhood Nephrotic Syndrome	Korean Society of Pediatric Nephrology
	113) Korean Treatment Guidelines for Obsessive-Compulsive Disorder	Korean College of Neuropsychopharmacology

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Table S1. Continued

Year	Clinical practice guidelines	Developer
	114) Clinical Guidelines on Testicular Tumor	Korean Urological Oncology Society
	115) Treatment Guidelines for Cardiovascular Complication in patients with Diabetes	Clinical Research Center for Diabetes
	116) Guidelines for Evaluation of Microalbuminuria in patients with Diabetes	Clinical Research Center for Diabetes
	117) Guidelines for Peripheral Artery Diseases in patients with Diabetes	Clinical Research Center for Diabetes
	118) Treatment Guidelines for Diabetes 2007 [†]	Korean Diabetes Association
	119) Treatment Guidelines for Stable Angina Clinical Practice Guideline for Ischemic Heart Disease [†]	Korean Society of Cardiology
	120) Medical Guideline of Menopausal Hormone Therapy	Korean Society of Menopause
	121) Korean Evidence Based Medication Guideline for Depression [†]	Clinical Research Center for Depression
	122) Guidelines for Inter-Hospital Transfer in patients with Critical Care	Ministry of Health and Welfare National Emergency Medical Center
2006	123) Guidelines for the Management of Unruptured Intracranial Aneurysms	Korean Society of Cerebrovascular Surgeons
	124) Korean Medication Guidelines for the Treatment with Schizophrenic Patients	Korean College of Neuropsychopharmacology Korean Society for Depressive and Bipolar Disorders
	125) Classification and Healing Results Reporting Guideline in Chronic Otitis Media Surgery	Korean Otologic Society
	126) Guidelines for the Management of Asthma	Korean Academy of Medical Sciences Korean Academy of Asthma, Allergy, and Clinical Immunology
2005	127) Community-acquired Pneumonia Management Guideline for Adults in Korea	Korean Academy of Tuberculosis and Respiratory Diseases
	128) Treatment Guidelines for Community-acquired Pneumonia in Korea: An Evidence-based Approach to Appropriate Antimicrobial Therapy [†]	
	129) Korean Guidelines for Bronchial Asthma	
	130) Korean Guidelines for Chronic Obstructive Pulmonary Disease	Korean Academy of Tuberculosis and Respiratory Diseases Clinical Research Center for Chronic Obstructive Airways Disease
	131) Treatment Guidelines for Rhinosinusitis	Korean Rhinology Society
	132) Guidelines on Management of Bladder Cancer*	Korean Urological Oncology Society
	133) Guidelines on Management of Head and Neck Cancer	The Korean Society for Radiation Oncology
2004	134) 2004 Korean Hypertension Treatment Guidelines [†]	Korean Society of Hypertension
	135) Guidelines on Management of Prostate Cancer	Korean Urological Association Korean Urological Oncology Society
2003	136) Clinical Guidelines on Renal Cell Carcinoma	Korean Urological Oncology Society Korean Urological Association
	137) Treatment Guidelines for Allergic Rhinitis [†]	Korean Rhinology Society
2002	138) Korean Medication Guidelines for the Treatment with Major Depressive Disorder [†]	Korean College of Neuropsychopharmacology Korean Society for Depressive and Bipolar Disorders
2001	139) Guidelines on Pharmacologic Treatment of Epilepsy	Korean Epilepsy Society
1997	140) Clinical Guidelines on Benign Prostatic Hyperplasia	Korean Urological Oncology Society
	141) Clinical Guidelines on Bladder Cancer [†]	

*Revised version; [†]Original version.