Assessment of the Quality of Clinical Practice Guidelines in Korea Using the AGREE Instrument

Min-Woo Jo, Jin Yong Lee, Nam-Soon Kim, Soo-Young Kim, Seungsoo Sheen, Seon Ha Kim and Sang-il Lee

1Department of Preventive Medicine, University of Ulsan College of Medicine, Seoul; 2Department of Preventive Medicine, Konyang University College of Medicine, Daejeon; 3Health Policy Research Division, Korea Institute for Health and Social Affairs, Seoul; 4Department of Family Medicine, Hallym University College of Medicine, Seoul; 5Department of Pulmonary and Critical Care Medicine, Ajou University School of Medicine, Suwon, Korea

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Address for Correspondence:
Nam-Soon Kim, MD
Health Policy Research Division, Korea Institute for Health and Social Affairs, Jinhung-ro 268, Eunpyeong-gu, Seoul 122-705, Korea
Tel: +82.2-382-8164, Fax: +82.2-352-9129
E-mail: artemine@kihasa.re.kr

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INTRODUCTION

Greater attention has been placed on evidence-based medicine in recent years, and as a result, various methods are being used to manage clinical evidence. In particular, considerable efforts have been made to develop clinical practice guidelines (CPGs). CPGs are systematically developed statements that assist practitioners with decisions regarding the appropriate health care of patients under specific circumstances (1). CPGs may have many different objectives. In addition to providing training and information to the health care providers or users, they serve to control cost and volume of medical services (2).

Outside Korea, and particularly in western countries, considerable efforts are being made to develop CPGs. The National Institute for Health and Clinical Excellence (NICE) in the United Kingdom, the National Health and Medical Research Council (NHMRC) in Australia, and the Scottish Intercollegiate Guidelines Network (SIGN), are among the many institutions establishing standards for new CPGs. Nevertheless, these standards do not guarantee the quality of CPGs (3). Subsequently, a group of researchers came together in the mid-1990s to promote the harmonized development and standardized evaluation of CPGs. They formed the Appraisal of Guidelines for Research and Evaluation (AGREE) Collaboration and developed the AGREE Instrument (4). The AGREE Instrument is intended to provide a framework for evaluating major elements of CPG quality, including development method and reporting of CPGs.

Many countries have adopted the AGREE Instrument to assess and validate the quality of CPGs, including CPGs for the management of particular diseases (5-8). It is also used to compare the quality of CPGs across countries (9) and for appraising the overall quality of CPGs developed within a country (10). In the case of Korea, translation work has been undertaken to facilitate the use of the AGREE Instrument (4), but no research has been done to assess the quality of all CPGs developed in Korea. This study aimed to assess the quality of CPGs in Korea using the AGREE Instrument.

The objective of this study was to conduct the systematic evaluation of methodological quality of clinical practice guidelines (CPGs) in Korea. The authors conducted a very comprehensive literature search to identify potential CPGs for evaluation. CPGs were selected which were consistent with a predetermined criteria. Four reviewers evaluated the quality of the CPGs using the Appraisal of Guidelines, Research and Evaluation (AGREE) Instrument. AGREE item scores and standardized domain scores were calculated. The inter-rater reliability of each domain was evaluated using the intra-class correlation coefficient (ICC). Consequently, 66 CPGs were selected and their quality evaluated. ICCs for CPG appraisal using the AGREE Instrument ranged from 0.626 to 0.877. Except for the “Scope and Purpose” and “Clarity and Presentation domains”, 80% of CPGs scored less than 40 in all other domains. This review shows that many Korean research groups and academic societies have made considerable efforts to develop CPGs, and the number of CPGs has increased over time. However, the quality of CPGs in Korea were not good according to the AGREE Instrument evaluation. Therefore, we should make more of an effort to ensure the high quality of CPGs.

Key Words: Clinical Practice Guideline; Quality Improvement
MATERIALS AND METHODS

Inclusion and exclusion criteria
To delve into the current state of Korea’s clinical practice guidelines, we first identified CPGs according to the following inclusion criteria: 1) documents containing recommendations with the aim of guiding decisions between practitioners and patients on prevention, diagnosis, treatment, rehabilitation and management of diseases; 2) documents citing references that provide the basis for recommendations; 3) all documents published after 2004 were considered as CPGs; and 4) for guidelines that were developed based on a consensus among professional groups, only those that were developed using a formal consensus method (such as a Delphi technique) were considered as CPGs. Documents excluded from the category of professional CPGs were: 1) narrative reviews; 2) primary studies; 3) critical pathways; 4) text-like; 5) training manuals for medical professionals; 6) guidelines for patients; 7) technical guide for assessment and diagnosis; 8) documents on development methods; 9) documents explaining CPGs and how to use them; 10) government’s health program guides for disease control; 11) translations of foreign guidelines; 12) guidelines or related documents developed by nursing, dental or oriental medicine societies; and 13) documents for which development methods could not be verified due to the original documents being unavailable.

Search for CPGs
The websites of academic societies engaged in CPG-related activities or other related organizations (i.e. the Korean Medical Guideline Information Center [KoMGI], the Korean Guideline Clearinghouse [KGC], the Health Insurance Review Agency [HIRA]) were reviewed to identify CPGs. In addition, we tried to gather information about the different CPGs available in Korea. Information specialists in the field of clinical medicine searched electronic documents. PubMed was searched as an international database, and KoreaMed, Medric (KMBase), Richis, NSDL (National Science Digital Library), National Assembly Library and KERIS Riss4u were searched as domestic databases. The search terms are shown in Table 1. Notes in academic conference papers and reports were also searched. The efforts to develop CPGs within clinical academic associations were also examined in parallel with a mail survey of 66 clinical academic associations which are not member societies of the Korean Academy of Medical Sciences (KAMS). All searched documents were reviewed by the chief researcher, and the original versions of the documents deemed to be relevant CPGs were obtained. Data were collected on the details such as development groups, financial source, development year, and revision status on each document identified as a CPG.

The AGREE instrument
The AGREE Instrument (4) comprises 23 key items organized into six domains, each of which identifies a unique dimension in terms of practice guideline quality. Domain 1 (Scope and Purpose) includes items 1-3 and evaluates the clarity of the overall aim of the guideline, the specific health questions, and the target population described in the guideline. Domain 2 (Stakeholder Involvement) covers items 4-6 and examines the extent to which the guideline represents the views of its intended users, and domain 3 (Rigor of Development) is concerned with the process of gathering and synthesizing the evidence, the methods used to formulate the recommendations, and updating them (items 7-14). Domain 4 (Clarity and Presentation) comprises items 15-18 and focuses on the language and format of the guideline, whereas domain 5 (Applicability, items 19-21) deals with the organizations likely to use the guideline and the costs of applying the guideline. Domain 6 (Editorial Independence) pertains to the independence of the recommendations and any possible conflicts of interest within the guideline development group (items 22-23). Each item is rated on a 4-point scale: “Strongly Agree (4),” “Agree (3),” “Disagree (2),” and “Strongly Disagree (1).” The higher the score, the higher the quality of each item.

Evaluation of CPGs
To evaluate the CPGs effectively and to strengthen consistency during appraisal, four members of our research team participated in the appraisal panel. Each member contributed his/her knowledge of developing and evaluating CPGs by attending a seminar prior to evaluating the CPGs. A CPG appraisal workshop was conducted so that several CPGs could be appraised in pilot runs. Each appraiser individually appraised CPGs and reviewed the results. Appraisers were given opportunities to hear each other’s views on the appraisal results. These discus-

| Database | Search terms |
|---|---|
| PubMed | guideline, guidelines, consensus, statements were used as search terms. while filtering results to authors who are Koreans |
| KoreaMed, Medric (KMBase) | guidelines, guide, guideline, recommendation, regulation, agreement |
| NSDL (by KISTI) | (guideline OR guidelines OR guide OR recommendation OR regulation) in subject terms |
| Richis | (clinical practice AND guidelines) OR (clinical practice AND recommendation) OR (clinical practice AND guide)* |
| National Assembly Library | (practice AND guidelines) OR (clinical practice AND guideline) OR (treatment AND guideline) OR (diagnosis AND guideline) |
| KERIS Riss4u | | *For the National Assembly database, “practice” must be indicated for other searches to access this database. |

Table 1. List of search terms
sions were conducted freely, as there was no desire to unify the results.

**Analysis**

Mean item scores and standardized domain scores for each CPG were calculated by averaging the scores across the four reviewers. Standardized domain scores were calculated as follows:

\[
\text{Obtained score} - \text{minimum possible score} \\
\text{Maximum possible score} - \text{minimum possible score}
\]

Standardized scores for each domain according to developing organization, financial source, development year, and revision status were compared using the t-test. Inter-rater reliability was calculated for each domain of the AGREE Instrument using the intra-class correlation coefficient (ICC). We used SPSS for Windows 14.0 (SPSS Inc., Chicago, IL, USA) for statistical analysis and a \( P \) value < 0.05 was considered significant.

**Ethics statement**

The study protocol was exempted from approval by the institutional review board of Asan Medical Center (IRB No. 2012-0489).

**RESULTS**

**Selection of CPGs**

The CPG selection process is presented in Fig. 1. By using various methods to examine the development of CPGs in Korea, we identified 713 documents as potential CPGs. Forty-six were obtained from CPG-related websites, three were identified through note searches, and 647 were identified from database searches. The survey of Clinical Academic Associations gained responses from 43/63 academic societies (a 68.3% response rate), and 17 CPGs from eight academic societies were identified.

The chief researcher reviewed the abstracts or documents and identified 276 documents as potential CPGs. The exclusion criteria eliminated 203 of these. Of the remaining potential documents, three were excluded by 4 reviewers since they were focused primarily on epidemiology and pathophysiology and their recommendations were obscure. Four other documents were actual CPGs, but were excluded from the review as the full document was not available. Sixty-six remaining documents were selected for inclusion in the study.

Finally 66 guidelines were selected for evaluation and several guidelines were published as an academic paper such as practice parameters for pervasive developmental disorder, management of chronic hepatitis B, guideline for chronic renal disease.

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**Fig. 1.** Flowchart showing selection of clinical practice guidelines.
and diagnostic guideline of ulcerative colitis (11-14).

When we examined the developing organization responsible for the 66 selected CPGs, we found that 47 (71.2%) CPGs were developed by academic organizations (i.e. academic societies). In terms of funding, 34 (51.5%) CPGs were supported by Republic of Korea Government and 5 (7.6%) were funded by the academic societies themselves (there were also cases in which private companies provided funding). However, the funding source could not be identified in 26 cases. We also observed an increasing trend in the number of CPGs developed over the years. Fifty-four (81.8%) of the CPGs reviewed were first editions and 12 (18.2%) were revised (Table 2).

Guideline appraisal results
The majority of the 66 CPGs appraised using the AGREE Instrument obtained very low scores. Except for the “Scope and Purpose” and “Clarity and Presentation” domains, 80% of CPGs scored less than 40. In particular, the median score in the “Applicability” domain was zero and that in the “Editorial Independence” domain was 4.2, indicating extremely low quality in these areas. The variability in the domain scores was quite wide, ranging from 45.8 to 88.9 (Fig. 2). Fifteen out of 23 AGREE items received a score of less than 2. Items in the “Clarity and Presentation” domain (except item 18), obtained relatively good values (Table 3).

Comparison of the standardized AGREE domain scores ac-

![Fig. 2. Distribution of standardized domain scores for 66 clinical practice guidelines. The top and bottom of the box represents the 75th (Q3) and 25th percentile (Q1), respectively, and the band near the middle of the box indicates the 50th percentile (the median). The upper and lower ends of the whisker represent Q3 + 1.5 × (interquartile range), and Q1-1.5 × (interquartile range), respectively. Small dot (o) represents outlier values which lies more than 1.5 times to 3.0 times interquartile range from either end of the whisker. Asterisk (*) represents extreme outlier values which lies more than 3 times interquartile range from either end of the whisker.](http://dx.doi.org/10.3346/jkms.2013.28.3.357)

Table 2. Characteristics of clinical practice guidelines reviewed in this study

| Category                  | Number of documents (%) |
|---------------------------|-------------------------|
| Developing entity         |                         |
| Academic organization (i.e. Academic Society) | 47 (71.2)               |
| Research group            | 18 (27.3)               |
| Other                     | 1 (1.6)                 |
| Funding source            |                         |
| Government                | 34 (51.5)               |
| Academic society          | 5 (7.6)                 |
| Not specified             | 26 (39.4)               |
| Private funding           | 1 (1.6)                 |
| Development year          |                         |
| 2004                      | 3 (4.5)                 |
| 2005                      | 8 (12.1)                |
| 2006                      | 8 (12.1)                |
| 2007                      | 19 (28.9)               |
| 2008                      | 19 (28.9)               |
| 2009 ( until June)        | 9 (13.6)                |
| Revision status           |                         |
| First edition             | 54 (81.8)               |
| Revised edition           | 12 (18.2)               |

Table 3. Standardized AGREE domain scores according to clinical practice guideline characteristics

| Year          | Scope & purpose | Stakeholder involvement | Rigor of development | Clarity & presentation | Applicability | Editorial independence |
|---------------|-----------------|--------------------------|-----------------------|------------------------|--------------|------------------------|
| 2004-06       | 32.7            | 13.2                     | 25.4                  | 50.2                   | 7.9          | 6.4                    |
| 2007-09       | 41.5            | 16.6                     | 25.5                  | 50.9                   | 6.0          | 5.2                    |
| P value       | 0.004*          | 0.081                    | 0.993                 | 0.801                  | 0.319        | 0.467                  |
| Funding       |                 |                          |                       |                        |              |                        |
| Government    | 37.4            | 13.3                     | 23.8                  | 52.1                   | 8.2          | 6.9                    |
| Others        | 40.6            | 18.1                     | 27.2                  | 48.2                   | 4.8          | 4.2                    |
| P value       | 0.253           | 0.007*                   | 0.089                 | 0.236                  | 0.045*       | 0.054                  |
| Subjective    |                 |                          |                       |                        |              |                        |
| Research group| 42.1            | 16.5                     | 26.1                  | 50.5                   | 6.2          | 4.3                    |
| Academic society | 31.0         | 12.8                     | 23.5                  | 51.9                   | 7.9          | 9.0                    |
| P value       | <0.001*         | 0.071                    | 0.218                 | 0.573                  | 0.386        | 0.008*                 |
| Revision      |                 |                          |                       |                        |              |                        |
| Yes           | 39.5            | 14.7                     | 26.0                  | 50.8                   | 6.7          | 5.2                    |
| No            | 36.6            | 20.0                     | 23.1                  | 50.0                   | 5.9          | 7.3                    |
| P value       | 0.420           | 0.022*                   | 0.238                 | 0.830                  | 0.713        | 0.385                  |

*P<0.05.
Table 4. AGREE item scores

| Domains and items of the AGREE instrument | Mean   | S.D.   | Median | IQR   |
|------------------------------------------|--------|--------|--------|-------|
| Domain 1: Scope and purpose              | 2.71   | 0.74   | 2.75   | 1.00  |
| 1. The overall objective(s) of the guideline is (are) specifically described |        |        |        |       |
| 2. The clinical question(s) covered by the guideline is (are) specifically described | 1.46   | 0.57   | 1.25   | 0.25  |
| 3. The patients to whom the guideline is intended to apply are specifically described | 2.33   | 0.66   | 2.25   | 0.75  |
| Domain 2: Stakeholder involvement        | 1.77   | 0.74   | 1.50   | 0.81  |
| 4. The guideline development group includes individuals from all the relevant professional groups |        |        |        |       |
| 5. The patients’ views and preferences have been sought | 1.11   | 0.21   | 1.00   | 0.25  |
| 6. The target users of the guideline are clearly defined | 1.97   | 0.77   | 1.75   | 1.25  |
| 7. The guideline has been piloted among end users | 1.03   | 0.16   | 1.00   | 0.00  |
| Domain 3: Rigor of development           | 1.41   | 0.51   | 1.25   | 0.50  |
| 8. The systematic methods were used to search for evidence |        |        |        |       |
| 9. The criteria for selecting the evidence are clearly described | 1.31   | 0.39   | 1.25   | 0.25  |
| 10. The methods used for formulating the recommendations are clearly described | 1.77   | 0.69   | 1.50   | 1.00  |
| 11. The health benefits, side effects and risks have been considered in formulating the recommendations | 2.48   | 0.54   | 2.50   | 0.81  |
| 12. There is an explicit link between the recommendations and the supporting evidence | 2.32   | 0.76   | 2.25   | 1.50  |
| 13. The guideline has been externally reviewed by experts prior to its publication | 1.81   | 0.70   | 1.75   | 1.31  |
| 14. A procedure for updating the guideline is provided | 1.24   | 0.30   | 1.25   | 0.25  |
| Domain 4: Clarity and presentation        | 2.83   | 0.30   | 1.25   | 0.25  |
| 15. The recommendations are specific and unambiguous |        |        |        |       |
| 16. The different options for management of the condition are clearly presented | 2.81   | 0.45   | 3.00   | 0.75  |
| 17. Key recommendations are easily identifiable | 2.98   | 0.71   | 3.25   | 1.25  |
| 18. The guideline is supported with tools for application | 1.45   | 0.66   | 1.00   | 1.00  |
| Domain 5: Applicability                  | 1.26   | 0.44   | 1.00   | 0.50  |
| 19. The potential organizational barriers in applying the recommendations have been discussed |        |        |        |       |
| 20. The potential cost implications of applying the recommendations have been considered | 1.13   | 0.35   | 1.00   | 0.06  |
| 21. The guideline presents key review criteria for monitoring and/or audit purposes | 1.01   | 0.04   | 1.00   | 0.00  |
| Domain 6: Editorial independence         | 1.24   | 0.24   | 1.25   | 0.50  |
| 22. The guideline is editorially independent from the funding body |        |        |        |       |
| 23. Conflicts of interest of guideline development members have been recorded | 1.09   | 0.40   | 1.00   | 0.00  |

Table 5. Intra-class correlation coefficient for mean rater scores by AGREE domain

| Domains                          | Means of raters ICC (95% CI) |
|----------------------------------|-------------------------------|
| Scope and purpose                | 0.820 (0.738-0.882)           |
| Stakeholder involvement          | 0.751 (0.637-0.837)           |
| Rigor of development             | 0.818 (0.734-0.880)           |
| Clarity and presentation         | 0.626 (0.464-0.754)           |
| Applicability                    | 0.689 (0.546-0.796)           |
| Editorial independence           | 0.877 (0.821-0.919)           |

Reliability measures of CPG appraisal using the AGREE Instrument showed high scores in general. The ICCs for AGREE appraisal conducted by the four raters were lowest in the “Clarity” domain (0.626), but higher in the “Scope and Purpose”, “Rigor of Development” and “Editorial Independence” domains (all > 0.8) (Table 5).

**DISCUSSION**

This was the first study to do systematic investigation of the methodological quality of CPGs in Korea. The important findings of this evaluation was that across different clinical areas, academic organizations and research groups have put a considerable amount of effort into developing CPGs, and the number of CPGs has increased every year. However, the overall quality of the CPGs was not good, particularly in the domains of “Applicability” and “Editorial independence”.

A total of 66 CPGs was selected from 713 documents identified through the comprehensive search. We can assume that the CPGs not identified in this study have little potential for use in practice. The CPGs evaluated in this report were primarily retrieved from CPGs deposited in the KoMGI database and the KGC. Search results from professional and general websites were added subsequently. Also, to cover CPGs developed by academic societies and research groups, the CPGs identified...
from surveys returned by academic societies in medical and healthcare fields (excluding those that are subsidiaries of the KAMS). Previous studies also excluded CPGs not identified in professional databases or by internet searches using appropriate search terms (10, 15).

The present study also shows that the quality of CPGs can be reliably evaluated using the AGREE Instrument as other studies applied the AGREE Instrument for CPG quality evaluation showed high reliability (10, 16, 17). We involved four experts with experience in developing or evaluating CPGs. In addition, the seminar and workshop conducted before the appraisals help to improve the general understanding of the AGREE Instrument items and also to achieve good reliability.

AGREE is an instrument used to evaluate the quality of CPGs by appraising development methods and related characteristics, among others (4). It focuses on how effectively the quality has been maintained throughout the CPG development process, clarity of purpose and scope, the involvement of stakeholders in the development process, the organization of the searches, and the selection methods used. AGREE does not assess the clinical content of CPGs. Therefore, a low score awarded to a particular CPG by the AGREE Instrument does not necessarily directly imply the low value of clinical contents. However, for CPGs that do not at least specify the use of logical methods, it is difficult for readers to assess suitability based on content alone. Thus, to develop high quality CPGs, the development process should at least be conducted in a systematic manner. This study did not identify an improvement in the quality of the CPGs over time, except in the “Scope and Purpose” domain. Some previous reports show that the various domains scores improved over time (6, 16, 18), whereas other did not (8, 15). However, considering cases in western countries such as UK which have systematic manuals for CPGs the quality of these processes could be improved if the appropriate methodology for CPG development is disseminated.

Compared with recent studies on CPGs developed in many developed countries based on the AGREE Instrument, the present study found that the quality of the CPGs developed in Korea was very low (5-9, 15-20). In particular, the quality of Korean CPGs was lower than those from other countries in terms of the “Applicability” and “Editorial Independence” domains, as reflected by the low absolute scores. Although most studies report relatively low scores in these two domains (6, 7, 10, 16, 18, 19-23), few report a score below 20 (10, 18, 22). For 13 out of 23 items, more than 80% were appraised as “Disagree” or “Strongly Disagree” in the present study. There were several cases in which the appraisal score was low because requirements of the items were met but were not specified in the CPG (i.e. ‘the guideline development group includes individuals from all the relevant professional groups’). Yet in most cases, a lack of awareness of each item appeared to be a problem, as suggested in the comments section by the raters. From a technical perspective, the following problems were raised: virtually none of the CPGs specified the development process separately, and the developing entity, source of funding, and ethical issues were hardly discussed. However, in some domains, especially “Scope and Purpose”, the scores improved over time. Zhang et al. reported that the quality of CPGs could be improved over time (6). Therefore, if CPG development groups appreciate the importance of scientific methodology, and understand how to achieve it, the quality of CPGs should improve further.

This study has a number of limitations. For instance, despite the various methods used to investigate CPGs, there was some difficulty in obtaining some original documents, which meant that some of the CPGs from the final pool were not appraised. However, most of the original documents were retrieved, so this should not greatly affect the overall appraisal results for Korea’s CPGs. Additionally, while the AGREE Instrument is an appropriate tool for evaluating a near-complete spectrum of CPGs, including newly developed, existing or updated ones, it is difficult to comprehensively evaluate CPGs that adaptation methods have been applied. Thus, we may need an alternative approach to evaluate CPGs that went through adaptation. Moreover, limitations exist within the AGREE Instrument itself; low scores are inevitable if not specified in the CPGs, even when the requirements are met, since the appraisal is based on the content described in the CPGs. In addition, the AGREE II Instrument has recently been developed and used to evaluate the quality of CPGs (24, 25). Researchers will therefore need to consider the new version of the AGREE Instrument in future. Despite these limitations, this study is useful because it is the first to assess the current CPGs available in Korea, and evaluates the quality of their development process.

Based on this study of CPG development in Korea, we can see that a considerable amount of effort has been put into their development. However, the overall quality was not good through the appraisal process using the AGREE Instrument. To develop high quality CPGs, effective strategies should be established to improve clarification of the subject of CPGs, the application of evidence-based systematic methods, and to deal with ethical issues. In particular, quality appraisals should be conducted, starting with the CPGs funded by the government, and continuous efforts should be undertaken to enhance the overall quality of CPGs in Korea.

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| No | Clinical Practice Guidelines* | Development Group* | Year |
|----|-----------------------------|-------------------|------|
| 1  | Clinical Practice Guideline for Stroke | Clinical Research Center for Stroke | 2008 |
| 2  | Treatment for Chronic Hepatitis B | The Korean Association for the Study of Liver | 2007 |
| 3  | Mechanical Ventilation in Chronic Obstructive Airways Diseases | Chronic Obstructive Airway Disease Research Center | 2007 |
| 4  | Korean Asthma Management Guideline for Adults | Chronic Obstructive Airway Disease Research Center | 2007 |
| 5  | Clinical Practice Guideline for Chronic Obstructive Pulmonary Disease | Chronic Obstructive Airway Disease Research Center | 2005 |
| 6  | Recommendation for Treatment of Colon Cancer | Clinical Research Center for Solid Tumor | 2005 |
| 7  | Recommendation for Treatment of Head and Neck Cancer | Clinical Research Center for Solid Tumor | 2005 |
| 8  | Evidence-based Pharmacological Treatment of Depression in Korea | Clinical Research Center for Depression | 2007 |
| 9  | Clinical Practice Guideline for Peripheral Arterial Disease in Diabetes | Korea National Diabetes Program | 2007 |
| 10 | Clinical Practice Guideline for Assessment of Microalbuminuria in Diabetes | Korea National Diabetes Program | 2007 |
| 11 | Clinical Practice Guideline for Treatment of Cardiovascular Complication in Diabetes | Korea National Diabetes Program | 2007 |
| 12 | Clinical Practice Guideline for Lifestyle in Type 2 Diabetes | Korea National Diabetes Program | 2008 |
| 13 | Clinical Practice Guideline for Body Weight Control in Type 2 Diabetes | Korea National Diabetes Program | 2008 |
| 14 | Clinical Practice Guideline for Psychological Support in Type 2 Diabetes | Korea National Diabetes Program | 2008 |
| 15 | Recommendation for Percutaneous Coronary Intervention | Clinical Research Center for Ischemic Heart Disease & The Korean Society of Cardiology | 2006 |
| 16 | Recommendation for Treatment of Acute Coronary Artery Syndrome | Clinical Research Center for Ischemic Heart Disease & The Korean Society of Cardiology | 2006 |
| 17 | Recommendation for Non-Percutaneous Diagnostic Intervention of Ischemic Heart Disease | Clinical Research Center for Ischemic Heart Disease & The Korean Society of Cardiology | 2006 |
| 18 | Recommendation for Stable Angina | Clinical Research Center for Ischemic Heart Disease & The Korean Society of Cardiology | 2006 |
| 19 | Clinical Practice Guideline for Treatment of Hepatitis C | The Korean Association for the Study of Liver | 2004 |
| 20 | Treatment Guideline of Complications of Liver Cirrhosis | The Korean Association for the Study of Liver | 2005 |
| 21 | Clinical Practice Guideline for Bronchial Asthma | The Korean Academy of Tuberculosis and Respiratory diseases | 2005 |
| 22 | Clinical Practice Guideline for Treatment of Tuberculosis | The Korean Academy of Tuberculosis and Respiratory diseases | 2005 |
| 23 | Clinical Practice Guideline for Community Acquired Pneumonia in Adults | The Korean Academy of Tuberculosis and Respiratory diseases | 2005 |
| 24 | 2004 Korean Hypertension Treatment Guideline | The Korean Society of Hypertension | 2004 |
| 25 | Physicians Guide for Diagnosis & Treatment of Osteoporosis 2008 | The Korean Society of Bone Metabolism | 2008 |
| 26 | 2006 Practice Guideline for Gynecologic Cancer, version1 | Korean Society of Gynecology Oncology & Clinical Research Center for Solid Tumor | 2006 |
| 27 | Clinical Practice Guideline for Pediatric Nephrotic Syndrome | Korean Society of Pediatric Nephrology | 2009 |
| 28 | Guidelines for Childhood Urinary Tract Infection | Korean Society of Pediatric Nephrology | 2009 |
| 29 | Clinical Practice Guideline for Chronic Renal Disease | The Korean Society of Nephrology | 2008 |
| 30 | Korean Clinical Practice Guideline of Depressive Disorders 2008 | Korean Academy of Medical Science, Korean Society for Depressive and Bipolar Disorders, Clinical Psychopharmacology and Neuroscience & Korean Society for Schizophrenia Research | 2008 |
| 31 | 2005 Korean Clinical Practice Guideline for Bronchial Asthma | The Korean Academy of Asthma, Allergy and Clinical Immunology | 2005 |
| 32 | Recent Opinion for Hormone Replacement Therapy | The Korean Society of Menopause | 2007 |
| 33 | Clinical Practice Guideline for Prophylactic Antibiotics Use in Caesarian Section and Total Hysterectomy | Korean Society of Obstetrics and Gynecology | 2008 |
| 34 | 2009 Clinical Practice Guideline for Transfusion Therapy and Use of Blood Product | Korea Centers for Disease Control & Prevention & The Korean Society of Blood Transfusion | 2009 |
| 35 | Clinical Practice Guideline for Prophylactic Antibiotics Use in Total Knee Replacement Arthroplasty | Korean Knee Society | 2008 |
| 36 | Clinical Practice Guideline for Prophylactic Antibiotics Use in Hip Arthroplasty | The Korean Orthopedic Association/Health Insurance Review & Assessment service | 2008 |
| 37 | Clinical Practice Guideline for Prophylactic Antibiotics Use in Coronary Artery Bypass Graft and Heart Valve Surgery | The Korean Society for Thoracic & Cardiovascular Surgery/Health Insurance Review & Assessment service | 2008 |
| 38 | Clinical Practice Guideline for Asthma in Korea | Korean Academy of Medical Science, The Korean Academy of Asthma, Allergy and Clinical Immunology, & The Korean academy of Tuberculosis and Respiratory diseases | 2007 |

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### Appendix 1. (continued from the previous page) Lists of Clinical Practice Guidelines*

| No | Clinical Practice Guidelines*                                                                 | Development Group*                                                                 | Year   |
|----|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------|
| 39 | Recommendation Guideline of Korean Society of Gynecologic Oncology and Colposcopy for Quadrivalent Human Papillomavirus Vaccine | Korean Society of Gynecology Oncology                                              | 2007   |
| 40 | The Korean Practice Parameter for the Treatment of Pervasive Developmental Disorders           | Korean Academy of Child and Adolescent Psychiatry                                 | 2007   |
| 41 | The Korean Practice Parameter for the Treatment of Attention-Deficit Hyperactivity Disorder      | Korean Academy of Child and Adolescent Psychiatry                                 | 2007   |
| 42 | Clinical Practice Guideline for Accurate Diagnosis and Effective Treatment of Gastrointestinal Stromal Tumor in Korea | Korean GIST Study Group                                                           | 2007   |
| 43 | Diagnostic Guideline of Ulcerative Colitis                                                    | Korean Association for The Study of Intestinal Diseases                           | 2009   |
| 44 | Diagnostic Guideline of Intestinal Tuberculosis                                               | Korean Association for The Study of Intestinal Diseases                           | 2009   |
| 45 | Diagnostic Guideline of Crohn’s Disease                                                       | Korean Association for The Study of Intestinal Diseases                           | 2009   |
| 46 | The Treatment Guideline of Korean Atopic Dermatitis                                           | The Korean Atopic Dermatitis Association                                          | 2006   |
| 47 | Korea Breast Cancer Society Practice Recommendations of Breast Cancer 2008                    | Korean Breast Cancer Society                                                      | 2008   |
| 48 | Management Guidelines for Patients with Thyroid Nodules and Thyroid Cancer                     | Korean Endocrine Society                                                          | 2007   |
| 49 | Clinical Practice Guideline for Smoking Cessation: Literature Review and Evidence Summary      | Seo HG, Cho HJ, Kim CH et al                                                      | 2005   |
| 50 | Diagnosis of Intestinal Behcet’s Disease                                                      | Korean Association for the Study of Intestinal Diseases and Korean IBD Study Group | 2009   |
| 51 | Revised Korean Medication Algorithm for Bipolar Disorder                                      | Korean College of Neuropsychopharmacology and Korean Society for Schizophrenia Research | 2008   |
| 52 | The Clinical Guidelines for Myelodysplastic Syndrome                                         | The Korean Society of Hematology                                                  | 2007   |
| 53 | Practice Guidelines for Management of the Difficult Airway                                    | The Korean Society of Anesthesiologist                                            | 2008   |
| 54 | Herpes Zoster and Post-Herpetic Pain                                                          | The Korean Society of Anesthesiologist                                            | 2008   |
| 55 | Perioperative Management for Patient Using Anticoagulants                                    | The Korean society of Anesthesiologist                                            | 2008   |
| 56 | Treatment Recommendation for Diabetes                                                        | Korean Diabetes Association                                                       | 2007   |
| 57 | Guideline for Treatment of Hyper lipidemia, 2nd ed                                              | Korean Society of Lipidology and Artherosclerosis                                  | 2009   |
| 58 | Korean Medication Algorithm for Generalized Anxiety Disorder 2009                             | Korean College of Anxiety Disorder/Korean Medication Algorithm for Generalized Anxiety Disorder Executive Committee | 2009   |
| 59 | Evidence-based Medicine Guideline for Posttraumatic Stress Disorder                           | Korean Academy of Anxiety Disorder/Korean College of Neuropsychopharmacology      | 2008   |
| 60 | Clinical Practice Guideline for Lung Cancer                                                   | Korean Association for the study of Lung Cancer                                    | 2007   |
| 61 | Korean Treatment Algorithm for Obsessive-Compulsive Disorder 2007                             | Korean Academy of Anxiety Disorder/Korean College of Neuropsychopharmacology      | 2007   |
| 62 | Korean Medication Algorithm for Panic Disorder 2008                                            | Korean Academy of Anxiety Disorder/Korean College of Neuropsychopharmacology      | 2008   |
| 63 | Pharmacologic Treatment Algorithm of Schizophrenia in Korea                                   | Committee for Pharmacologic Treatment Algorithm of Schizophrenia in Korea         | 2006   |
| 64 | Clinical Practice Guideline for Prophylactic Antibiotics Use in Cholecystectomy               | Korean Surgical Society                                                           | 2008   |
| 65 | Clinical Practice Guideline for Prophylactic Antibiotics Use in Gastrectomy                   | Korean Surgical Society                                                           | 2008   |
| 66 | Clinical Practice Guideline for Prophylactic Antibiotics Use in Colectomy                     | Korean Surgical Society                                                           | 2008   |

*If there was no English subject, researchers arbitrarily translated Korean into English.