

Special Article



Neurotrauma Clinical Practice Guidelines Committee of the Korean Neurotraumatology Society: A Review of a Group That Writes and Inherits the Thoughts and Will of the Society



Received: Apr 5, 2022

Accepted: Apr 12, 2022

Published online: Apr 20, 2022

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ABSTRACT

The Neurotrauma Clinical Practice Guidelines Committee of the Korean Neurotraumatology Society (KNTS-NCPGC) is developing clinical guidelines for neurotrauma in line with the capabilities of the Korean Neurotraumatology Society, which is leading pioneering development in the field of neurosurgery. From the mid-1990s, the KNTS-NCPGC has been working to develop guidelines and disseminate evidence-based medicine, including the development of Korean guidelines for the management of severe head injuries and active participation in the Clinical Practice Guidelines Committee of the Korean Academy of Medical Sciences. The KNTS-NCPGC strives to write and inherit the will of the society through the development of clinical practice guidelines, which are one of the outcomes representing professionalism and public interest and can be expressed in terms of “trust” and “best.” In this review, the history and achievements of KNTS-NCPGC, the status of the ongoing development of guidelines, and the perspectives of the committee are covered.

Keywords: Trauma, nervous system; Neurosurgery; Practice guideline; History; Republic of Korea

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Conflict of Interest

The authors have no financial conflicts of interest.

INTRODUCTION

The Neurotrauma Clinical Practice Guidelines Committee of the Korean Neurotraumatology Society (KNTS-NCPGC), affiliated with the Korean Neurotraumatology Society (KNTS), contributes to the promotion of public health through the development and dissemination of clinical guidelines and evidence-based medical care for neurotrauma, a major prognostic determinant of traumatic diseases. The committee comprises one chairperson (director), one vice-chairperson (secretary), and other members, and its main functions are to analyze the latest trends and knowledge related to neurotraumatology, develop evidence-based and patient-centered neurotrauma clinical practice guidelines, and participate in national research projects.

Since its founding in 1993, the KNTS has been developing clinical practice guidelines suitable for the domestic medical situation in the Republic of Korea. The history of KNTS-NCPGC can be arbitrarily classified into 3 generations according to the time and activity: the first generation developed Korean guidelines for severe head injury by organizing a task force team and laid the foundation for the committee; the second generation established and systematized the committee; and the third generation standardized and advanced the development system along with a number of members acquiring the evaluator qualification as a member of the Clinical Practice Guidelines Committee of the Korean Academy of Medical Science (KAMS-CPGC). With the full support of the society, the KNTS-NCPGC continues to develop patient-centered clinical practice guidelines based on universal and rational evidence.

KNTS-NCPGC FIRST AND SECOND GENERATION (~2014): SYSTEMATIC ORGANIZATION OF THE CLINICAL PRACTICE GUIDELINE DEVELOPMENT PROCESS IN THE FIELD OF NEUROTRAUMATOLOGY

From the mid-1990s, developed countries such as the United States, Europe, and Japan have improved treatment performance for trauma patients through standardized treatment by developing their own clinical guidelines suitable for their situation. Since the establishment of “the Korean Society for Neurotraumatology,” the predecessor of the KNTS, in 1993, Korean clinical practice guidelines for neurotraumatic diseases have been continuously developed in consideration of the domestic medical situation and insurance system.

After the Korean Society for Neurotraumatology was promoted from a “research society” to a “society,” the KNTS, in 2000, organized a task force team for the development of Korean guidelines and announced the “Korean Guidelines for the Management of Severe Head Injury” in 2004, with 12 neurotraumatology experts participating. **TABLE 1** summarizes evidence-based guidelines until April 2004 for 15 sections.²⁴⁾ Because these guidelines are based on evidence available up to 2004, it may differ from the current standard of care. However, it can be evaluated as a pioneering academic activity, considering that the Korean Medical Guidelines Information Center (KoMGI) was established in January 2008 and the first clinical guidelines by committee evaluation were developed in 2014. Amidst the society's continued interest and efforts toward the development of clinical guidelines, the establishment and system of the KNTS-NCPGC in 2013 were embodied. Since 2013, the

TABLE 1. (Continued) Summary of 'Korean Guidelines for the Management of Severe Head Injury' (2004, KNTS)

No.	Section	Guideline	Options (recommendation)
13	Antiepileptic drug	- Antiepileptic drug is useful to prevent early post-traumatic seizure	- Prophylactic antiepileptic drug is recommended in patient with one or more of the followings 1) Abnormal CT finding, especially parenchymal damage 2) History of post-traumatic seizure or presenting seizure immediately after trauma 3) Depressed skull fracture or penetrating brain injury 4) GCS score 10 or less
14	Hypothermia		- Hypothermia at 32°C–35°C begins within 6 hours and lasts for 24–48 hours.
15	Surgical management	Indication - Thickness >1 cm of extracerebral hematoma clot or intracerebral hematoma >25–30 mL - Midline shift >5 mm - Compression of the 3rd ventricle or basal cistern - Dilation of contralateral lateral ventricle - Neurologic deterioration - Increasing ICP	- Empirical decompressive craniectomy may be performed when ICP is refractory to the medical treatment or when severe brain swelling is evident during surgery for hematoma removal

KNTS: Korean Neurotraumatology Society, GCS: Glasgow Coma Scale, ECG: electrocardiogram, SaO₂: oxygen saturation, ER: emergency room, TBI: traumatic brain injury, CT: computed tomography, OR: operating room, ICP: intracranial pressure, ICU: intensive care unit, CVP: central venous pressure, CPP: cerebral perfusion pressure, ABGA: arterial blood gas analysis, CO₂: carbon dioxide, CSF: cerebrospinal fluid.

committee's list of executives by session (**TABLE 2**) is described below. As of 2022, clinical practice guidelines are being developed by a team of 10 members, consisting of 8 members and 2 advisors (**TABLE 3**).

TABLE 2. List of past executives, KNTS-NCPGC

Years	President	Director	Secretary
2013–2014	Sang Ryong Jeon	In Bo Han	
2014–2015	Taek Hyun Kwon	Jeong Eun Kim	Soo Eon Lee
2015–2016	Dong Keun Hyun	Seung Myung Moon	Jung-Ho Yun
2016–2017	In-Soo Kim	Moon-Kyu Kim	Kyuha Chong
2017–2018	Byung Moon Cho	Moon-Kyu Kim	Kyuha Chong
2018–2019	Do-Sung Yoo	JeHoon Jeong	Kyuha Chong
2019–2020	Hee-Jin Yang	Kyuha Chong	Hyuk-Jin Oh
2020–2021	Se-Hyuk Kim	Kyuha Chong	Hyuk-Jin Oh
2021–2022	Jin-Hwan Cheong	Kyuha Chong	Kyung Hwan Kim

KNTS-NCPGC: Neurotrauma Clinical Practice Guidelines Committee of the Korean Neurotraumatology Society.

TABLE 3. List of present executives, KNTS-NCPGC (2022)

Position	Name	Affiliation
Advisor	Kyung Suk Lee	Soonchunhyang University
Advisor	JeHoon Jeong	Soonchunhyang University
Director	Kyuha Chong	Samsung Medical Center
Secretary	Kyung Hwan Kim	Chungnam University
Member	Young il Kim	Catholic University
Member	Youngbeom Seo	Yeungnam University
Member	Kyu-Sun Choi	Hanyang University
Member	Hyuk-Jin Oh	Soonchunhyang University
Member	Min Ho Lee	Catholic University
Member	Sae-min Kwon	Keimyung University

KNTS-NCPGC: Neurotrauma Clinical Practice Guidelines Committee of the Korean Neurotraumatology Society.

KNTS-NCPGC THIRD GENERATION (2014~): EFFORTS TO STANDARDIZE AND ADVANCE CLINICAL PRACTICE GUIDELINE DEVELOPMENT PROCESS

Since 2014, activities have been conducted to standardize and advance the guideline development process, starting with KNTS members' participation in education and qualification as evaluation committee members of the KAMS-CPGC. From 2013 to February 2022, 10 neurosurgeons were appointed as members of the KAMS-CPGC, 5 of whom were members of the committee. Leading efforts of the KNTS have continued to develop clinical practice guidelines. Currently, the committee has shown its dynamic capabilities as a KNTS-affiliated committee by participating in KAMS-CPGC education programs, conducting education as an instructor, and producing winners for the Excellence Award in KAMS-CPG.

The Brain Trauma Foundation (BTF) was established in 1986 to improve the prognosis of traumatic brain injury patients. The first evidence-based clinical practice guideline, "Guidelines for the Management of Severe Head Injury," was published in 1996 (1995, based on BTF)¹⁾ and the second revised edition was published in 2000.²⁻²¹⁾ In 2007, the third edition was developed along with a title change to 'Guidelines for the Management of Severe Traumatic Brain Injury,'²²⁾ and the fourth edition in 2017 (2016, based on BTF).²³⁾

In 2016, the KNTS-NCPGC planned to develop a Korean guideline for severe traumatic brain injury that can be approved by the KAMS-CPGC and KoMGI, considering the clinical importance and social needs in line with the revised guidelines of the BTF. To implement this, 1) completion of education by the KAMS-CPGC, expansion of activities in KoMGI, and 2) consideration of questions and grounds applicable to domestic circumstances, including the BTF guidelines, were conducted simultaneously. While setting, reviewing, and developing Korean recommendations that are not limited to translation as an initial goal, it was confirmed that there are many major limitations in both adaptation and de novo methods in developing Korean severe brain trauma clinical guidelines. The main points are that 1) randomized controlled trials (RCT) for severe brain damage diseases due to ethical problems are not sufficient to derive evidence-based results, 2) RCT progress in Korea is more difficult to implement due to complex medical problems, and 3) national medical insurance. It was confirmed that it is difficult to approach the development of Korean severe brain trauma clinical care guidelines as a short-term project, and it is necessary to expand the educated manpower and development experience from a long-term perspective. Under in-depth discussions by the committee and other societies, the committee was reorganized twice in 2018 and 2019 and established KNTS-NCPGC with the aim of reducing the scope of diseases and topics subject to clinical care guideline development but leading clinical care guidelines through standardization and advancement. In addition, we are doing our best to conduct a systematic review according to PRISMA statements and develop clinical practice guidelines in accordance with the K-AGREE II.

Survey on the demand for clinical practice guidelines in the field of neurotraumatology

One of the first important steps to be implemented in developing clinical practice guidelines is to derive socially and publicly necessary and meaningful questions along with clinical trials and to establish valid verification of the validity of the questions. Therefore, to confirm the demand and necessity of developing clinical care guidelines in the neurotrauma area, two

surveys were conducted, and data collection and analysis were conducted through online survey methods from December 2018 to June 2019.

As of May 2019, 83 members, nearly 25% of 333 members of the society, responded to the survey, with 87% of them directly undergoing treatment in trauma, 10% of whom were mainly treated with trauma patients, and 89% knew about the clinical guidelines. More than 98% of respondents needed to develop clinical guidelines in the field of neurotraumatology. They answered, and as necessary reasons, they responded with a “systematic approach and insurance response (45%)” and “reference for treatment (41%).” As a result of organizing and analyzing the responses, the most difficult aspects in applying the previously developed overseas clinical guidelines were “unexpected complications and accompanying damage (34%),” “insurance standards (32%),” and “different surgical or conservative treatment standards (31%)” for each medical staff. The biggest reasons were “lack of domestic research data based on domestic medical reality” and “difficulty in random control research (47%)” as the reasons for difficulty in objectifying or developing clinical practice guidelines in the field of neurotraumatology. Although objectification is difficult and there are many limitations, more than 93% of respondents answered that it is necessary to develop clinical practice guidelines in the field of neurotraumatology. The KNTS-NCPGC began to re-examine and re-discuss the development process along with the subject, field, and scope of clinical care guideline development based on the results of this survey, with the development of “universal and everyone's recognition” as the top priority.

After discussing and considering the development of clinical guidelines and strengthening KNTS-NCPGC capabilities from various perspectives, chronic subdural hematoma, which is a reduced disease range compared with severe traumatic brain damage but has significantly increased in prevalence and related studies and papers. The detailed goal was to strengthen KNTS-NCPGC capabilities by performing development as a standard principle from the first stage to the last stage of clinical care guideline development. The goal of this study was to establish a standardized development process and cultivate more advanced professional development personnel to establish a mid- to long-term capacity and system to continuously develop clinical guidelines for various neurological damage-related diseases above severe traumatic brain injury.

Preparation and application for national research projects

Through the review process of the 2016 BTF “Guidelines for the Management of Seven Trauma Brain Injuries,” the resolution and limitations of clinical practice guidelines in the field of neurotraumatology analyzed by KNTS-NCPGC were summarized as follows: In the case of accommodation development, 1) because of the characteristics of traumatic diseases, there are many cases where the level of evidence and recommended grades for core questions are low due to large biases and 2) clinical, social, and economic comparative evaluations should be conducted. In addition, the following problems emerged to meet the criteria for evaluating new development and clinical care guidelines by (K-)AGREE II: 1) in-depth consideration of stakeholders' participation, such as bias of interest groups (users, users, etc.) and viewpoints and preference surveys of population groups (patients, general public, etc.); 2) specialized analysis of risk/promotion factors and costs; and 3) initial development plan.

We believe that the KNTS-NCPGC needs to play a pivotal role in continuing the development of clinical care guidelines in the field of neurotraumatology and in planning and continuing to promote orders for national research projects to provide an opportunity to create greater

motivation. Starting in February 2020, a task force team within the KNTS-NCPGC has been formed to continue challenging tasks on the subject that can reflect field- and basis-oriented medicine. The plan for KNTS-NCPGC research personnel and development costs consists of strengthening researchers' capabilities and contributing to the expansion of research scope after R&D and establishing a new concept clinical practice guideline development system through the use of fourth industry-based element technology.

Development of 'Korean Clinical Practice Guidelines for Chronic Subdural Hematoma'

After an online survey, the subject was selected as having a chronic subdural hematoma, and the KNTS-NCPGC began the key questions and the Population, Intervention, Comparison and Outcome (PICO) derivation process in July 2019. Research papers from various perspectives on chronic subdural hematoma have been published, but most of them are single-institutional studies or limited treatment policies or studies on imaging and diagnostic perspectives, which has led to a lack of research results based on the need for Korean clinical guidelines. In addition, the guidelines for chronic subdural hematoma were the only guidelines published in Danish by researchers at four Danish institutions in 2018, and there were insufficient data to refer to for acceptance and development.

Accordingly, the KNTS-NCPGC decided to first conduct a risk factor analysis that could be the starting point for the necessity of multicenter research and the need for standardization of chronic subdural hematoma treatment and then to conduct a multicenter study on cohorts with generalized characteristics for the first time in Korea. Seven institutional review board deliberation and case record DB management-solution development and database construction were completed in July 2020, and data on 190 variables of 293 adult patients who underwent surgical treatment for chronic subdural hematoma for 1 year were collected and analyzed.

The result of the analysis showed that recurrence requiring reoperation in chronic subdural hematoma was significantly higher in patients with preoperative separated hematoma-type chronic subdural hematoma (odds ratio [OR], 3.906; $p=0.017$), and low (OR, 0.277; $p=0.017$) results were observed in patients under general anesthesia. The results of this study were reported in the *Journal of the Korean Neurosurgical Society* and published in September 2021.²⁵⁾ Although there were a limited number of patients, it was of great significance in that it provided a basis for the need to develop clinical guidelines for chronic subdural hematoma and establish a multicenter research process within the KNTS-NCPGC. It was also presented as one of the KNTS-NCPGC research results in the challenge of research tasks.

Based on the results of previous studies, it was recognized that clinical guidelines are needed for the diagnosis and treatment of chronic subdural hematoma, and key questions were raised for the development of clinical guidelines for chronic subdural hematoma. A total of 36 key questions were first confirmed in four areas, namely, diagnosis, surgical treatment, conservative treatment, and prevention, and 6 key questions and PICOs were derived through Delphi techniques three times. To verify the validity of the derived key questions in advance, 3,622 papers were collected and derived from the PubMed, Embase, Cochrane, and KoreaMed databases through the Korea University Medical Library specialist librarian. As of January 2022, prior analysis and evaluation of systematic literature reviews, including thesis reviews and meta-analyses, are being conducted, and expert surveys on the derived questions are scheduled after the prior re-evaluation of validity is completed.

CONCLUSION

The KNTS-NCPGC is working to develop clinical practice guidelines and disseminate evidence-based medical treatment in the field of neurotraumatology in line with the KNTS's ability to lead the pioneering development of neurosurgery. From the beginning of society to the present, the KNTS subcommittee, which has been striving to develop clinical practice guidelines with constant support and will, is striving to become a group that can lead the field of neurosurgery. The "clinical guidelines" are one of the results representing expertise and public interest and are also expressed in words of "trust" and "best."

The KNTS-NCPGC will continue its best efforts as a group that writes and inherits society's deep concerns about scientific evidence-based care and the society's willingness to conduct patient-centered care and research through the development of clinical practice guidelines.

ACKNOWLEDGMENTS

We would like to express our deepest gratitude to our respected senior and junior members and many researchers who have given us many lessons and extended help until KNTS-NCPGC has become what it is today. We also acknowledge Eun-Ji Kang of the Korea University College of Medicine for helping with the development of clinical guidelines.

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