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Original Article

An Assessment Rubric for a Resident Training Program in Surgery: A Single-Institution Experience

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Using a Collaborative Action Research model, our research team established a one-month clinical resident training program for first- and second-year clinical residents. We created and implemented an assessment rubric to assess the residents' progress toward independent practice in surgery, and thereby, to evaluate the program itself. The program included training in three areas: basic techniques and procedures in the operating room, surgical ward management, and academic activities. The rubric measured the residents' performance according to three achievement levels: Level 1 (demonstration), Level 2 (active help) and Level 3 (passive help). The program and rubric implementation began in June 2019 and continued until March 2020, when the program outcomes and shortcomings were analyzed. Among nineteen clinical residents, a total of nine clinical residents participated in the study. Most participants reached achievement Level 3 for their performance of basic techniques in the operating room. Finally, we discussed ideas for improvement and drafted plans for an improved rubric to complete the action research cycle. Our research team found the rubric to be a useful tool in evaluating the status of the new clinical resident training program.

Key words: resident program, rubric assessment, general surgery, action research

A new clinical resident training system was established in Japan in 2004 [1]. After graduating from medical school and passing the National Medical Board Examination, all medical graduates are assigned to university hospitals or clinical training hospitals, where they spend two years in supervised rotations designed to prepare them to become medical practitioners [1]. This clinical training experience offers trainee doctors the opportunity to acquire basic diagnostic and treatment skills and to consider more fully the social role fulfilled by medicine and medical services. Regardless of their future specialties, residents benefit from training that provides instruction on appropriate treatment for common injuries and diseases <Ministry of Health, Labour and Welfare, https://www.mhlw.go.jp/english/wp/wp-hw3/dl/2-055.pdf (accessed Nov 14, 2020)>. During their residency, trainee doctors rotate through different departments and receive training in various specialties. In the past, clinical surgical training was mandatory, but in 2010, a revision to the law made surgical training an elective program. Additionally, the revision stipulated that surgical education should last for at least one month and, currently, many residents participate in at least 30 days of one month's surgical training.

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In Japan, a recent decline in the number of surgeons has made it difficult to maintain surgical services at many hospitals, especially regional hospitals [2]. Resolving this problem has become an urgent social issue. Research has identified difficult working conditions as a major factor behind the dwindling number of surgeons, while other deterrents may include the high risk of lawsuits or the failure to recruit young surgeons [1]. Additionally, reports on factors influencing on medical students' decision not to pursue surgery as a career revealed that the prolonged duration or length of training required, in conjunction with other negative aspects of the job, contributed to their disinterest [3, 4]. According to the changes of the postgraduate training system in 2004, surgical residency was delayed until the third postgraduate year [1]. Furthermore in 2010, a revision to the law made surgery an elective subject. After the revision, some clinical residents who did not receive surgical education finished their residency program without having had any exposure to surgery to help them know whether or not they might have interest or talent for it. We considered that as a first step toward increasing the numbers of clinical residents who select surgical education during the clinical residency programs at an early stage, it is important to review surgical education programs to ensure they are attractive to a wide range of clinical residents.

Previously, surgical resident education followed a strict apprenticeship model [5], for which "see one, do one, teach one" has been the mantra for over a century [6]. This apprenticeship model involved simplified systems that encouraged trainees to progress from passive learners to competent practitioners through graded responsibility and progressive autonomy in surgical practice [6]. Worldwide, the field of surgical resident education has recently undergone a marked transformation to evidence-based training, but in Japan, this movement remains in its infancy [5]. In order to catch up with global trends, we propose that surgical resident education and training programs provide a more structured learning environment that reduces cognitive overload by simplifying and presenting information in an organized, progressive manner. Such an environment would better support residents as they progress through each phase of skill development, providing a consistent and structured approach when teaching new skills [7]. Additionally, we suggest that surgical resident education programs in Japan put more effort into promoting surgical occupations among medical students and clinical residents before they specialize.

Okayama City Hospital was relocated and newly constructed at its current site in 2015. At the same time, various personnel changes were made by the hospital managers. A new surgery department with new members was created in 2018 with the support of Okayama University. Unfortunately, our hospital was no exception, and clinical residents in our hospital had been provided with a surgical training environment that had been negligent, with little thought given to educational methodology and proper program. Therefore, surgery did not seem particularly attractive to clinical residents, and the numbers of clinical residents who selected surgery during their rotations each year were low. We consider it important to clarify the purpose and goals of surgical training and to create an appropriate educational environment, to improve surgical education and make surgery more attractive for clinical residents. In 2019, we developed a new clinical resident training program in surgery and an assessment rubric to accompany it. The aim of the program was to provide satisfactory surgical training despite the short training period and provide a better understanding of surgical occupations by teaching basic surgical skills and procedures required for medical practice to all clinical residents, even those who may not aspire to become surgeons in the future.

Our study employed a Collaborative Action Research design, in which multiple researchers who serve as organizational and university personnel worked in tandem to identify a need and develop a potential solution related specifically to educational training programs [8]. Action research can be said to combine real-life efforts at improvement with research, reflection on outcomes, and revision. The rubric assessment designed by our team provided data on the new clinical resident training program and allowed us to assess the residents' progress by tracking their transition from reliance on their supervisors to independence in their own medical practice. At the same time, it allowed us to evaluate whether the program was meeting the goals laid out above, as well as the expectations of the government, hospitals, and surgical residents. Herein, we report the outcomes of the new training program and identified issues to consider for future improvement.

Materials and Methods

In 2019, members of the surgery department at Okayama City Hospital, with the support of Okayama University, designed a new clinical resident training program (hereinafter referred to as the new training program) for clinical residents and adopted a written rubric to assess the program. Both the new training program and rubric assessment were based on the research team's collective educational experiences, on the surgical education curriculum created by the Japan Surgical Society, and on the postgraduate training program introduced by the Ministry of Health, Labour and Welfare (Table 1A, 1B). The new training program was designed for a one-month duration. The training tasks were surgical skills that would be useful to doctors regardless of the specialties that the clinical residents aspired to pursue in the future. The supervising doctors gave the clinical residents the opportunity to train in each task named in the rubric during their surgical training.

There are three different sections to the rubric: basic techniques in the operating room, surgical ward management, and academic activities. The seven tasks in the "basic techniques in the operation room" section are skills that should be mastered for basic surgery. Surgical ward management includes eight tasks divided into two subsections: general practice (electronic medical charts, medical records, treatments, wound care and drain management, meetings for perioperative management, and skills for medical practice) and perioperative management (tasks such as understanding of surgical diseases, patients' care and the flow of operation needed before the operation or after operations). The academic activities section (1 task) basically comprises self-study of topics identified as requiring a more solid understanding. We aim to nurture clinical residents to be able to learn on their own, to solve clinical questions and acquire a research mindset by collecting medical information and reviewing contents of papers logically.

When clinical residents started their surgical training, they were given a brief outline explaining the new training program and associated rubric. Each resident completed their training and filled out a self-assessment for each item on the rubric with the aim to reach

Table 1A Assessment rubric sheet for training for basic techniques in the operating room

Training details			Achievement levels		
			Level 1 Demonstration	Level 2 Active help	Level 3 Passive help
Basic techniques in the operating room	Preoperative techniques	Surgical scrubbing technique (hand washing with soap and water or alcoholic hand rub)	Acquisition of knowledge about techniques	Practical training under guidance	Implementation under supervision
		Gowning and gloving technique	Acquisition of knowledge about techniques	Practical training under guidance	Implementation under supervision
	Intraoperative techniques	Surgical skin disinfection and sterile drapes placement	Acquisition of knowledge about techniques	Practical training under guidance	Implementation under supervision
		Surgical instruments and laparoscopy	Acquisition of knowledge about basic instrument manipulation	Manipulation under guidance	Securing the surgical field with instruments
	Suturing and knot-tying techniques	Basic suturing techniques	Acquisition of knowledge about instrument manipulation and treatment of wounds	Acquisition of appropriate suturing skills on artificial models	Acceptable suturing of surgical field under guidance
		Knot-tying techniques	Acquisition of knowledge about knot-tying techniques	Acquisition of appropriate knot-tying skills on artificial models	Acceptable knot-tying in surgical field under guidance
		Local anesthesia	Acquisition of knowledge about local anesthesia	Practical training in administering local anesthetic to wounds under guidance	Administering local anesthetic to wounds with pain assessment

Table 1B Assessment rubric sheet for performance of surgical ward management and academic activities

Training details			Achievement levels		
			Level 1 Demonstration	Level 2 Active help	Level 3 Passive help
Surgical ward management	General practice	Electronic medical charts	Learn how to operate the electronic medical records system	Understanding perioperative clinical pathways and instructions	Issue instructions for perioperative management under guidance
		Medical records	Understanding preoperative medical information and preparing conference records	Filling out medical records for ward rounds under guidance	Filling out medical records based on physical examinations
		Treatments	Acceptable levels of standard precautions and hand hygiene	Changing dressings and removing stitches under guidance	Removing drains under guidance
		Wound care and drain management	Acquisition of knowledge about wound care and drain management	Recording findings related to the condition of wounds and liquid discharges	Evaluation of wound condition and drain management
		Meetings for perioperative management	Participation in meetings	Preparation for presentations	Participation in debates about having clinical doubts and problems
		Skills for medical practice	Acquisition of basic knowledge about physical examinations, appropriate manner of speaking, and personal appearance	Taking history of symptoms and physical examinations under guidance	Taking history of symptoms and physical examinations under supervision
	Perioperative management	Before the operation	Acquisition of basic knowledge about diseases related to patients under care	Understanding of preoperative examination findings of patients under care	Understanding of diseases and conditions of patients under care
		Operations	Acquisition of basic knowledge of operative procedures related to patients under care	Gaining understanding of actual operations through participation	Understanding the flow of operation
Academic activities	Independent learning	Self-study	Acquisition of skills required for collecting data from medical articles or other information resources	Data collection and understanding of medical articles as they relate to clinical questions	Presentation and discussion after reading an English article

achievement Level 3 by the end of the program. At the end of the one-month training program, supervising doctors held a meeting with each resident to review, evaluate, and revise the residents' achievement levels for each item and provide personalized feedback. The results reported in our study reflect the scores of the residents' self-assessments and the supervising doctors' assessments of residents who underwent surgical training between June 2019 and March 2020.

Construction of the Rubric. A rubric is a scoring tool that lays out the expectations for an assignment in a learner-centered assessment approach that encourages positive behavioral changes through self-assessment [9]. Rubrics are used for any number of assessment purposes, including those related to program evaluation or measurement of student progress, from a novice to a professional level [10]. Regardless of the type of rubric utilized for assessment, positive results and experiences are consistently reported by faculty and researchers [11]. Rubrics have also been shown to promote consistency in scoring, motivate learners to reach the next achievement level, provide timely feedback, and improve overall instruction even in clinical settings [9]. The use of assessment rubrics has been steadily increasing among organizations in the United States for many years. Recently, many of these rubrics have been adopted and applied to a number of Japanese contexts, including medical education. For example, rubrics have already been applied to assessment in Japanese orthoptic education [12] and dentistry education [13].

The rubric used in this study outlines specific areas of assessment that can be scored separately and then combined for an overall score [14] and was based on a modified version of the Zwisch model [15]. Additionally, the rubric incorporates the use of self-assessment as well as supervisor assessment, as recommended by McTighe and Willis, well-known experts in the neuroscience of learning and instructional design

[14]. Based on the rubric, clinical residents are scored according to three levels of achievement: Level 1, called Demonstration, measures a resident's ability to accurately describe or demonstrate an activity after the direct and immediate instruction of a supervising doctor; Level 2, called Active Help, refers to a resident's ability to perform the required task with some instructor intervention like vocal cues, visual aids, or step-by-step instructions; Level 3, called Passive Help, refers to a resident's ability to perform the required task by themselves under supervision and occasional correction.

This study was approved by the institutional review board at Okayama City Hospital (IRB No. 4-94). Clinical residents who selected surgery during this study period were given an informed consent before their surgical training and participated in this program of their own free will.

Results

Nine clinical residents (herein referred to as participants) participated in the new one-month training program from June 2019 to March 2020. The participants' background data are shown in Table 2. The duration of training that the participants had undergone before arriving at the surgical department varied markedly. The participants' performances, which was measured by achievement levels according to the assessment rubric, can be seen in Tables 3A and 3B. Most participants reached Level 3 in basic preoperative techniques, including scrubbing, gloving, and gowning, which are necessary in many fields of medical care. However, the achievement levels for other basic techniques used in the operating room, including intraoperative techniques, knot-tying techniques, and local anesthesia, varied. These more complicated techniques can take longer to learn, and it might be difficult to master them within the short period of time allotted for the new training program. Additionally, the opportunities to administer local anesthesia were not standardized, and participants' achievement levels at the end of the new training program varied. Because the new training program was designed to evaluate the participants' performances mainly in the surgical ward and in the operating room but not at outpatient clinics, local anesthesia was only administered for the removal of some kinds of drains or indwelling catheters, and some participants did not have many opportunities to take part in these kinds of procedures during the new training program.

Table 2 Distribution of residents by training time prior to surgical rotation

Duration of training time	Number of residents
1-6 Months	4
7-12 Months	2
13-18 Months	1
19-23 Months	2
Total	9

Overall, the participants' performances of surgical ward management was found to be lacking. For example, nearly half of the participants did not reach Level 3 for the task of creating medical records. In addition, many participants struggled to use electronic medical charts, which are an important tool used for perioperative management, medical practice, and meetings.

The supervisor scores for perioperative management, which is a subsection under performance of surgical ward management, revealed differences in how participants assessed their own achievement levels and how supervisors assessed participants' achievement levels. In this new training program, participants are required to act independently and decisively, but the capability of the participants to understand patients' clinical problems is understandably limited. Still, participants seemed to have very high expectations for themselves and often judged their achievements at lower levels than their supervisors did for this subsection of the rubric. Similarly, there were differences in assessment regarding performance of wound care and drain management, another subsection under performance of surgical ward management. Assessment of these skills involves subjective reasoning, and many participants felt that they performed unsatisfactorily and judged themselves harshly. Conversely, evaluators were more generous in their evaluation.

As for independent learning and self-study, the participants' achievement levels varied markedly. The achievement levels for this task under academic activities seemed directly related to individual motivation levels and many of the residents who participated in our study were not planning to specialize in surgery.

In summary, participating residents did well when completing basic techniques in the operating room that are common to many medical fields, including proper

hand scrubbing, glove application, and dressing in gowns and other protective medical gear. However, participants did not achieve Level 3 for more complex tasks like manipulation of surgical instruments or surgical ward management. The achievement levels for academic activities varied and seemed to depend on individual interest and motivation. A detailed distribution chart of the achievement levels for the nine clinical residents who participated in the study can be found in Tables 3A and 3B.

Discussion

According to the guidelines of the Ministry of Health, Labour and Welfare, training hospitals must provide programs that teach residents to provide appropriate treatment for common injuries and diseases <Ministry of Health, Labour and Welfare, https://www.mhlw.go.jp/english/wp/wp-hw3/dl/2-055.pdf> (accessed Nov 14, 2020). The guidelines outline the symptoms, diseases, examinations, and medical procedures that residents need to learn. However, this outline is relevant to multiple departments, and there are limitations to what can be taught by a single department. In addition, the guidelines do not state which skills should be taught in each department. Therefore, the selection of what subjects or skills are taught by each department, as well as the appropriate educational methods, are determined by each hospital that participates in training clinical residents in Japan. This means that the goals of surgical education for residents at different hospitals can vary markedly. The goal of the new training program implemented at the surgical department at Okayama City Hospital was to teach basic skills and techniques of surgery as well as common medical practices used across departments, such as general practice and independent learning. The framework for the new training program was based on the research team's surgical experience, on the surgical education curriculum recommended by the Japan Surgical Society, and on the postgraduate training program introduced by the Ministry of Health, Labour and Welfare. We also aimed to ensure that the new training program would provide an overview of surgical occupations while still being informative and suitable for residents who do not aspire to specialize as surgeons in the future.

Table 3A Achievement levels for basic operating room techniques

Training details			Evaluator	Level 1 (N)	Level 2 (N)	Level 3 (N)
Basic techniques in the operating room	Preoperative techniques	Surgical scrubbing techniques	Resident	0	0	9
			Supervising doctor	0	0	9
		Gowning and gloving techniques	Resident	0	0	9
			Supervising doctor	0	0	9
	Intraoperative techniques	Surgical skin disinfection and sterile drapes placement	Resident	0	7	2
			Supervising doctor	0	5	4
		Surgical instruments and laparoscopy	Resident	0	4	5
			Supervising doctor	0	2	7
	Suturing and knot-tying techniques	Basic suturing techniques	Resident	0	0	9
			Supervising doctor	0	2	7
		Knot-tying techniques	Resident	1	1	7
			Supervising doctor	0	2	7
		Local Anesthesia	Resident	4	3	2
			Supervising doctor	2	3	4

Highest number of residents in each category were highlighted in gray.

Table 3B Achievement levels for performance of surgical ward management and academic activities

Training details			Evaluator	Level 1 (N)	Level 2 (N)	Level 3 (N)
Surgical ward management	General practice	Electronic medical chart	Resident	2	3	4
			Supervising doctor	1	4	4
		Medical records	Resident	0	4	5
			Supervising doctor	0	3	6
		Treatments	Resident	0	1	8
			Supervising doctor	0	0	9
		Wound care and drain management	Resident	0	5	4
			Supervising doctor	0	2	7
		Meetings for perioperative management	Resident	0	2	7
			Supervising doctor	0	5	4
		Skills for medical practice	Resident	0	5	4
			Supervising doctor	1	3	5
	Perioperative management	Before the operation	Resident	0	5	4
			Supervising doctor	0	3	6
		Operations	Resident	0	5	4
			Supervising doctor	0	4	5
Academic activities	Independent learning	Self-Study	Resident	3	1	5
			Supervising doctor	1	2	6

Highest number of residents in each category were highlighted in gray.

Recently, the focus of surgical training and residency has shifted from traditional apprenticeship models to competency and outcome-based models [16]. The Zwisch model of step-by-step progress toward autonomy has been developed for the teaching of cardiothoracic surgeons, providing a conceptual framework to help interactions between trainers and trainees in the operating room [15]. The aim of our rubric asssessment adapted the concept of the Zwisch model to promote a shift to the outcome-based model, which ensures acquisition of a defined knowledge base, competencies and technical trainings required of medical practitioners, and for clinical residents to become autonomous in general surgery. In our study, the actual rubric assessment became a process rather than a one-time performance evaluation. There is a mixture of simple and complex issues among the tasks. We would like to think that the principle of evaluation should be the ascertainment of what tasks clinical residents can or cannot competently perform. In reality, however, only simple tasks can be evaluated in terms of proficiency, while the more complex ones become a matter of whether or not clinical residents have experienced them. Due to the nature of departments of surgery and the limitations of a short period of one month, it is necessary to revise the tasks because it is impossible to make a clear distinction between the two.

Although it is important that programs should be established from the perspective of continuity and connection with pre-graduate education, it is difficult to identify which tasks of surgery should be selected, which goals should be set and what level of achievement should be expected from the viewpoint of accrediting medical practitioners. For clinical residents who participated in a clinical clerkship before graduation, our program included some tasks related to the skills

and attitudes already learned and required of medical students, such as medical records and medical practice. We evaluated the clinical residents not only by considering the connections with what they learned in the clinical clerkship but also with more specialized surgical perspectives as medical practitioners. In the future, it is necessary to revise tasks and goal setting to take into account the continuity from pre-graduation and the deferent levels of achievement between medical students and clinical residents.

Using this evaluation system, we found that residents reached varying achievement levels depending on the complexity of the tasks as well their individual motivation levels. Throughout the new training program, we encouraged residents to actively participate in surgical practices and to strive for independent execution of surgical skills. However, according to the impressions of the supervising doctors, the amount of effort that residents put in to mastering the given tasks seemed directly related to their intentions regarding their future specialties. Typically, supervising doctors held a meeting with the resident after the completion of the one-month training. However, some clinical residents did not progress smoothly through their one-month training. In that case, meetings were held midway through the program to discuss the reasons for any delays or problems between participants and supervising doctors, and to provide opportunities to adjust the training for continued active participation.

The sections of the rubric that assessed the performance of basic techniques in the operating room and performance of surgical ward management were evaluated mainly by technical skills rather than non-technical skills such as personal qualities required of medical professionals. We discovered an imbalance in the assessment of technical and non-technical skills. In addition, these assessments without an upper limit of learning goals, allowed the participants to gain a deeper understanding of surgery through not only on-the-job experiences but also self-study; however, a one-month period was not a sufficient amount of time for residents to be guided toward mastering these techniques or skills.

While an assessment rubric was useful for both clinical residents and supervising doctors, there were also problems for both parties. The advantages identified by clinical residents were as follows: learning content was standardized because tasks and goals were clarified, and trainees could grasp where they stood in the learning process and perform specific activities to achieve goals. The advantages identified by supervising doctors were as follows: the contents to be taught were clear, assessments could be made quickly and easily, there were generally no significant discrepancies in assessment results among multiple evaluators, and supervising doctors provided guidance when differences arose between trainee and evaluator perceptions of achievement. The disadvantages were as follows: all tasks could not always be experienced equally by each participant, clinical residents tended to strive only for the listed tasks and not to participate fully in tasks that are not listed, rubric assessments may have taken away participants' intrinsic motivation in the training, and there were difficulties in providing guidance when differences arose between trainee and evaluator perceptions of achievement. Thus, it was necessary to evaluate whether appropriate tasks and assessments were being made and to improve them. We received no opinions on the rubric assessment itself, but comments and impressions from participants of clinical residents as follows: appreciation for the clarity of the learning contents, gratitude for supervising doctors' careful and kind guidance, and assurance that it was easy to discuss questions and issues with supervising doctors. There were no negative and critical comments about this training.

Our research of rubric assessments revealed specific problems in our training program. First, it is necessary to consider whether the training tasks highlighted by our program are indeed appropriate for trainees to become medical practitioners, which is the goal of the training. Therefore, we should review and reconsider the achievement goals for each task. Second, although our program is designed to provide clinical residents with experiences in tasks by supervising doctors for rubric assessment, it was not sufficient to expose them to certain experiences in clinical settings. Additional auxiliary methods need to be added to facilitate learning, such as making instructional materials, and introducing simulation training. Third, supervising doctors need to have some teaching skills to facilitate the program. The supervising doctors are surgical specialists, not educational specialists. It seems necessary for the supervising doctors themselves to acquire some knowledge of pedagogy. The purpose of this study was to evaluate a new training program and rubric assessment

created as an initial step; therefore it is expected that further improvements will be implemented.

The new training program also has limitations regarding its use for surgical education of residents seeking to become medical practitioners. First, even though rubric-based assessment made it possible to evaluate residents' achievement levels more objectively, the construct validity and reliability of the new training program and assessment rubric have not been evaluated according to methods used in traditional research models. In general, the assessment data have little or no meaning without confirmation of their validity [17]. While it is difficult to assess the validity and reliability of the present study through conventional quantitative theory, there are other recognized ways to evaluate rigor in action research projects. For example, Hendricks (2009) identified nine ways to assess validity in action research, several of which apply to this study [8]. In particular, the action research cycle that we adopted for the educational improvement of this new training program upheld outcome validity, catalytic validity, democratic validity, and dialogic validity through the peer debriefings, continuous ongoing planning, member checks, and the presentation of results [8].

Second, the variety and complexity of surgical skills that could be taught during the new training program were limited by the short training period and a lack of clarity regarding the goals and outcomes of surgical education residence training programs at teaching hospitals in Japan. This is not only a limitation of the new training program that we implemented, but a national issue. The main goal of clinical resident programs in Japan is to train clinical residents to become medical practitioners. However, surgical education provided as part of clinical resident training programs is often limited to acquiring basic diagnostic and treatment skills, regardless of future specialties <Ministry of Health, Labour and Welfare, https://www.mhlw.go.jp/english/wp/wp-hw3/dl/2-055.pdf> (accessed Nov 14, 2020). As a direct result, the achievement levels employed in this study were limited to mastering the basic skills required by a general practitioner to provide primary care for medical conditions requiring surgery.

Third, the new training program did not sufficiently cover professionalism as a core competency. Medical education should encompass moral development as well as technical skills and attempt to build and sustain proper behavior in all trainees [18]. Thus, professionalism should be taught in the early years of medical training and should be included as part of the core curriculum. However, our ability to achieve this in the new training program was limited by the short training period and the fact that it was delivered by a single department.

Establishment of an educational system that it is organized by well-defined goals and an educational methodology that makes it easier to learn about surgery will better convey the appeal of surgery to Japanese doctor in training. We believe that this will increase the number of residents who choose surgery because they will feel less resistance. This paper reports on the initial phase of an action research that had the goal of establishing an educational system in our hospital. To complete the Collaborative Action Research cycle, our research team met again in the summer of 2020 to discuss the new training program and rubric. The team adjusted the rubric for future use by including items that assess professional ethics and leadership skills. The team also sought the advice of educational professionals and the opinions of clinical residents to make further improvements. The evaluation of the new structure of the clinical training program using a rubric provided invaluable information to help us immediately improve our teaching strategies and meet our goal of developing a more attractive surgical training program.

In conclusion, we created a one-month surgical education training program for clinical residents and evaluated the residents' achievement levels using a rubric. The Collaborative Action Research model provided opportunities for university faculty to explore more about the uses of assessment in teaching, and to develop a realistic educational program that meets the needs of students and surgical departments. As a result of implementing this new training program, a greater number of clinical residents have chosen to complete their surgical training at the surgical department at Okayama City Hospital since June 2019. In the future, we plan to continue developing new clinical resident training programs based on the 2020 updated guidelines issued by the Ministry of Health, Labour, and Welfare with the goal of addressing the declining number of surgeons in regional medical care centers by encouraging more clinical residents to select surgery as their specialty.

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