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Clinical Report

Clinical Care Provided on Post-graduate Dental Clinical Training Course at Tokyo Dental College Chiba Hospital, Department of General Dentistry

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Abstract

Number of patients assigned to dental residents, course of treatment and number of various technical tasks performed as described in the Reports on Clinical Training of Dentists published by the Department of General Dentistry, Tokyo Dental College Chiba Hospital since its establishment in 2002 were compared between before (2003–2005) and after (2006–2007) clinical training was made mandatory, and the state of clinical residency evaluated. Number of patients assigned generally increased, and mean number of patients treated by each resident in 2007 (15.08) was approximately 2 times higher than that in 2003 (8.47). Total number of treatments was 1.38 times higher in 2007 than in 2003, and periodontal treatment accounted for approximately 40% of all treatment both before and after clinical training became mandatory. Number of technical tasks in 2004–2007 was less than half the peak in 2003. To further improve clinical training, evaluation and implementation of effective approaches is necessary to secure an adequate number of patients, widen the variety of cases and increase the number of technical tasks.

Key words: Clinical care—Post-graduate course—Clinical training course—General Dentistry—Tokyo Dental College Chiba Hospital

Introduction

Under the clinical training system for dentists, work toward implementation of clinical training was made mandatory by the 1996 amendment of the Dental Practitioners Law. Thereafter, in 2000, the Medical and Dental Practitioners Laws were simultaneously

amended by the Law to Partially Amend the Medical Care Law, and clinical training was made mandatory in 2004 for physicians and in 2006 for dentists²⁾. In these circumstances, Tokyo Dental College organized a clinical training system at 3 hospitals, *i.e.*, the Chiba, Suidobashi, and Ichikawa General Hospitals, and the Department of General Dentistry was

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established at the Chiba Hospital in 2002.

The Dental Practitioners Law stipulates that “Clinical training must be designed to allow dentists to develop an attitude appropriate as a dentist, understand the social role that dental science and dental services are expected to play, and acquire basic diagnostic and therapeutic abilities regardless of the specialties that they will pursue in the future so that they can appropriately treat injuries or diseases frequently encountered in general practice”. Therefore, to clarify the state of clinical activities of dentists under clinical training at the Department of General Dentistry, Chiba Hospital, we reviewed the Reports on Clinical Training of Dentists⁴⁻⁸⁾ published before (2003–2005) and after (2006–2007) clinical training was made mandatory. We investigated number of patients assigned, content of clinical activities, and number of technical tasks performed on the basis of the summary tables of number of patients assigned and diagnostic and therapeutic procedures and technical tasks performed after the establishment of the Department of General Dentistry, Chiba Hospital in 2002.

Materials and Methods

The summary tables of numbers of patients, clinical actions, and technical tasks assigned to dental residents at the General Dentistry, Chiba Hospital in the Reports on Clinical Training of Dentists published in 2003–2005⁴⁻⁶⁾ and 2006–2007^{7,8)} before and after clinical training was made mandatory were reviewed. Num-

ber of patients, contents of clinical actions, and number of technical tasks assigned were compared annually and between before and after clinical training was made mandatory to evaluate the state of clinical training at the Department of General Dentistry, Chiba Hospital.

Results

1. Number of dental residents and patients assigned

1) Mean number of patients

Mean number of patients assigned to a dental resident was 8.47 in 2003 but increased steadily until it nearly doubled to 15.08 in 2007 (Table 1). The target number of patients suitable to allow a team of 2 trainees to be able to perform a diagnosis and provide treatment with little delay, 5 days a week as suggested in the report by Takahashi *et al.*³⁾, is considered to have been attained. Table 1 shows the mean, maximum, and minimum numbers of patients in Terms 1–3 from 2003 to 2007. They all increased between 2003 and 2007. Mean number of patients also increased with the advance of the term from 1 to 3 in each year except in Term 2 of 2005 (Table 1).

2) Number of dental residents

Total number of dental residents was 84 (Term 1: 36, Term 2: 30, Term 3: 18) in 2003, 83 (Term 1: 30, Term 2: 34, Term 3: 19) in 2004 and 79 (Term 1: 26, Term 2: 29, Term 3: 24) in 2005 before clinical training became mandatory. It was 112 (Term 1: 38, Term 2: 38, Term 3: 36) in 2006 and 93 (Term 1: 33,

Table 1 Changes in number of patients from 2003–2007

	MNP	Term 1			Term 2			Term 3		
		Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.
2003	8.47	5.69	9	4	8.93	13	7	10.78	14	8
2004	10.53	8.53	13	5	9.18	15	6	13.89	24	8
2005	10.18	9.15	11	7	7.41	12	4	13.96	19	8
2006	10.09	8.32	12	5	10.71	18	6	11.25	16	7
2007	15.08	13.48	17	10	15.50	19	10	16.25	24	9

Mean number of patients: MNP

unit: person

Term 2: 32, Term 3: 28) in 2007 after clinical training became mandatory. Mean number of dental residents was 82 in 2003–2005 but increased by 25% to 102.5 in 2006–2007.

3) Relationship between number of dental residents and mean number of patients

As shown in Table 1, the mean number of patients per resident was 8.32 in Term 1 of 2006, when the number of dental residents was highest (38), and 10.71 in Term 2 of 2006 (38). That in Term 3 of 2003, when the number of dental residents was lowest (18), was 10.78. Also, the mean number of patients per resident nearly tripled in Term 3 of 2007 (16.25, number of residents: 28) compared with Term 1 of 2003 (5.69, number of residents: 36). Number of patients assigned to

each resident increased steadily, even when the decrease in the number of residents by 8 in Term 3 of 2007 compared with Term 1 of 2003 is taken into consideration.

Also, the mean number of patients assigned to each resident decreased when the number of dental residents, which varied among years and terms, was 35 or higher (Fig. 1).

2. Clinical actions performed by dental residents

1) Outline of clinical actions

Total number of treatments increased approximately 1.38 times in 2007 compared with 2003 (Table 2). Among treatment categories, total number of periodontal treatments was highest, followed by endodontic

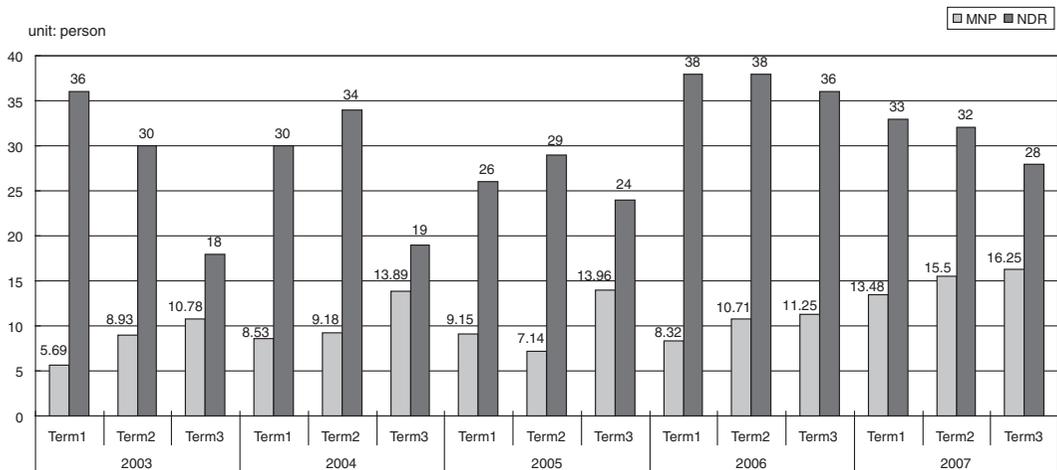


Fig. 1 Changes in number of residents and mean number of patients per resident from 2003–2007
Mean number of patients: MNP, Numbers of dental residents: NDR

Table 2 Outline of numbers of treatments in various categories

	PT	ET	RT	CB	RP	ST	Total
2003	2,239	1,196	843	1,042	706	281	6,307
2004	2,464	1,506	583	1,202	687	213	6,655
2005	3,329	1,527	898	843	643	269	7,509
2006	2,548	1,644	1,164	1,101	843	259	7,559
2007	3,626	1,414	1,045	1,105	1,118	372	8,680
Total	14,206	7,287	4,533	5,293	3,997	1,394	36,710

unit: case

Periodontal treatment: PT, Endodontic treatment: ET, Restorative treatment: RT, Crown and bridge prosthetic treatment: CB, Removable prosthodontic treatment: RP, Oral surgical treatment: ST

treatments, crown and bridge prosthetic treatments, restorative treatments, removable prosthodontic treatments and oral surgical treatments from 2003 to 2007, from 2003 to 2005, before clinical training became mandatory, and from 2006 to 2007, after clinical training became mandatory (Table 2).

From 2003 to 2007, number of periodontal treatments was highest (Table 2), accounting for about 40% of all treatments, with no marked change either before or after clinical training became mandatory.

Concerning changes in content of treatment, number of periodontal treatments, restorative treatments, removable prosthodontic treatments and oral surgical treatments increased almost progressively from 2003 to 2007, but number of other treatments generally remained similar with some annual variations (Table 2).

The percentages of various treatments were generally similar between before and after clinical training became mandatory, despite

slight variation in some treatment categories.

2) Details of content of treatment

(1) Periodontal treatment

Concerning periodontal treatment, data regarding periodontal examination, tooth brushing instruction (TBI), scaling, scaling root planing (SRP) and other treatments were analyzed.

Number of treatments was highest for scaling, number of periodontal examinations increased annually, and those of TBI, scaling, and SRP also generally increased with time (Table 3). Percentages of various treatment categories were generally similar between before and after clinical training became mandatory, despite some differences among categories. Percentage was highest for scaling in both periods, being 28% in 2003–2005 and 31% in 2006–2007.

(2) Endodontic treatment

Concerning endodontic treatment, data were collected regarding pulpectomy under anesthesia, treatment of infected root canals,

Table 3 Number of periodontal treatments

	PE	TBI	Scaling	SRP	Other	Total
2003	327	464	712	377	359	2,239
2004	355	477	699	388	545	2,464
2005	506	476	924	721	702	3,329
2006	575	398	750	529	296	2,548
2007	808	615	1,140	770	293	3,626
Total	2,571	2,430	4,225	2,785	2,195	14,206

unit: case

Periodontal examination: PE, Tooth brushing instruction: TBI, Scaling root planing: SRP

Table 4 Number of endodontic treatments

	PE	TIRC	RCDA	RCF	Other	Total
2003	85	257	567	148	139	1,196
2004	84	332	743	195	152	1,506
2005	89	197	788	188	265	1,527
2006	111	307	889	236	101	1,644
2007	112	241	775	202	84	1,414
Total	481	1,334	3,762	969	741	7,287

unit: case

Pulpectomy under anesthesia: PE, Treatment of infected root canals: TIRC, Root canal drug application: RCDA, Root canal filling: RCF

root canal drug application, root canal filling and other treatments.

Number of treatments was highest in each year for root canal drug application, and number of treatments other than treatment of infected root canals, root canal drug application and others was stable with slight annual variations (Table 4). Percentages of various treatments generally did not change between 2003–2005 and 2006–2007, despite slight variations in some treatment categories. Percentage of root canal drug application was highest in both periods, being 49% and 55%, respectively.

(3) Restorative treatment

Concerning restorative treatment, data regarding composite resin restoration, preparation and impression of inlay, and inlay placement were collected.

Number of composite resin restorations was highest, and those of preparation and impression of inlay and inlay placement were nearly the same. Total number of treatments was lowest in 2004, highest in 2006 and approximately 2 times higher in 2006 compared with in 2004. Number of treatments showed slight progressive increases (Table 5). Percentages of treatments were generally similar between 2003–2005 and 2006–2007 with slight variations in individual categories. Percentage of composite resin restorations was highest in both periods, being 60% and 63%, respectively.

(4) Crown and bridge prosthetic treatment

Concerning crown and bridge prosthetic treatment, data regarding preparation and

impression of crown, crown placement, preparation and impression of bridge, bridge placement, preparation and impression of metal core, metal core placement, other prosthetic treatments and placement of other prostheses were analyzed.

Numbers of all treatments were lowest in 2005. Among all treatments, number of crown prosthetic treatments was highest each year, and numbers of preparation and impression of bridge, bridge placement and placement of other prostheses were low. Number of preparation and impression of crown was approximately 1.2 times higher in 2007 than in 2003, that of crown placement was approximately 1.8 times higher in 2007 than in 2003, but those of preparation and impression of bridge, bridge placement, preparation and impression of metal core, metal core placement and placement of other prostheses were nearly the same in all years except 2005 (Table 6). Percentages of various treatments were generally

Table 5 Number of restorative treatments

	CRR	PII	IP	Total
2003	517	184	142	843
2004	329	142	112	583
2005	549	187	162	898
2006	752	220	192	1,164
2007	654	215	176	1,045
Total	2,801	948	784	4,533

unit: case

Composite resin restoration: CRR, Preparation and impression of inlay: PII, Inlay placement: IP

Table 6 Number of crown and bridge prosthetic treatments

	PIC	CP	PIB	BP	PIM	MP	OPT	POP	Total
2003	171	108	62	39	180	128	307	47	1,042
2004	214	166	67	36	187	155	323	54	1,202
2005	152	121	28	21	148	127	212	34	843
2006	175	155	70	36	185	155	271	54	1,101
2007	210	191	53	40	149	139	280	43	1,105
Total	922	741	280	172	849	704	1,393	232	5,293

unit: case

Preparation and impression of crown: PIC, Crown placement: CP, Preparation and impression of bridge: PIB, Bridge placement: BP, Preparation and impression of metal core: PIM, Metal core placement: MP, Other prosthetic treatments: OPT, Placement of other prostheses: POP

similar between 2003–2005 and 2006–2007, despite some changes in individual treatment categories. Percentages of preparation and impression of crown, crown placement, preparation and impression of metal core, metal core placement and other prosthetic treatments were 17, 13, 17, 13 and 28%, respectively, in 2003–2005 and 17, 16, 15, 13 and 26%, respectively, in 2006–2007.

(5) Removable prosthodontic treatment

Concerning removable prosthodontic treatment, data regarding the final impression of removable dentures, bite taking of removable dentures, placement of removable dentures, adjustment of removable dentures, repair of dentures, denture relining and mucosal adjustment were analyzed.

Among various treatments, number of denture adjustment was highest. Number of final impression of removable denture was approximately 1.9 times higher, number of bite taking of removable dentures was approximately 1.9

times higher, number of placement of removable dentures was approximately 1.8 times higher and number of denture adjustment was approximately 1.8 times higher in 2007 than in 2003. Numbers increased progressively, and numbers of other treatments also increased, despite some fluctuations (Table 7). Among various treatments, percentage of denture adjustment was highest in both 2003–2005 and 2006–2007, being 55 and 56%, respectively.

(6) Oral surgical treatment

Concerning oral surgical treatment, data regarding abscess incisions, tooth extractions, conduction anesthesia and other treatments were analyzed.

Number of tooth extractions was highest among treatments. It increased annually and was 1.4 times higher in 2007 than in 2003. Numbers of other treatments also increased, despite some annual fluctuations (Table 8). Percentages of various treatments remained

Table 7 Number of removable prosthodontic treatments

	FID	BTD	PD	AD	RD	DR	MA	Total
2003	61	45	69	384	93	28	26	706
2004	67	49	61	374	87	36	13	687
2005	48	39	50	382	85	20	19	643
2006	79	82	92	429	110	19	32	843
2007	118	87	121	672	82	26	12	1,118
Total	373	302	393	2,241	457	129	102	3,997

unit: case

Final impression of removable dentures: FID, Bite taking of removable dentures: BTD, Placement of removable dentures: PD, Adjustment of removable dentures: AD, Repair of dentures: RD, Denture relining: DR, Mucosal adjustment: MA

Table 8 Number of oral surgical treatments

	AI	TE	CA	Other	Total
2003	7	151	14	109	281
2004	6	113	14	80	213
2005	10	135	15	109	269
2006	8	144	13	94	259
2007	10	215	12	135	372
Total	41	758	68	527	1,394

unit: case

Abscess incisions: AI, Tooth extractions: TE, Conduction anesthesia: CA

similar between 2003–2005 and 2006–2007, despite some changes in individual treatments. Percentage of tooth extraction was highest, being 52% in 2003–2005 and 57% in 2006–2007.

3. Numbers of technical tasks performed by dental residents

Data concerning the preparation of custom trays, preparation of inlays, preparation of crowns, preparation of bridges, preparation of metal cores, preparation of removable dentures, preparation of sprints, preparation of temporary crowns and preparation of other materials were analyzed.

Total number of technical tasks, which was 1,106 in 2003, decreased to less than half, being 418 (37.8%) in 2004, 374 (33.8%) in 2005, 522 (47.2%) in 2006 and 488 (44.1%) in 2007. While there was no change between 2004 and 2007, slight increases were observed in 2006 and 2007 compared with in 2004 and 2005 (Table 9).

Concerning numbers of individual tasks, those of preparation of custom trays, preparation of inlays, preparation of crowns, preparation of metal cores, and preparation of temporary crowns were high each year, but numbers of all tasks except those of preparation of inlays, preparation of metal cores and preparation of sprints decreased markedly compared with in 2003 (Table 9).

Percentages of various tasks were generally similar between 2003–2005 and 2006–2007, despite some fluctuations in individual tasks,

and those of preparation of bridges, preparation of crowns, and preparation of sprints were low. Percentages of preparation of custom trays, preparation of inlays, preparation of metal cores, preparation of temporary crowns and other technical tasks were 15, 15, 15, 26 and 16%, respectively, in 2003–2005 and 11, 23, 22, 29 and 7%, respectively, in 2006–2007.

In 2006–2007, number of bridge preparation was only 1. This is considered to be a serious problem, and more intensive instruction in technical tasks is necessary for the future.

Discussion

1. Number of patients

The progressive increase in the mean number of patients per resident from 2003 to 2007 is considered to have been due to the increase in the total number of patients at the Department of General Dentistry, *i.e.*, the increases in the mean number of patients per instructor (about 35) and the mean number of recall patients (about 15).

The mean number of patients increased with the advance from Term 1 to Term 3 in each year, probably because residents became willing to examine more patients in the preliminary examination stage and began to be involved in the care of more difficult cases as they got used to the tasks at the department. The mean number of patients was low in

Table 9 Number of technical tasks

	CT	IN	CR	BR	MC	RD	SP	TC	Other	Total
2003	194	136	55	7	130	65	8	298	213	1,106
2004	44	50	25	3	90	13	5	123	65	418
2005	49	94	30	0	73	17	2	79	30	374
2006	58	101	21	1	111	20	6	166	38	522
2007	58	130	14	0	111	10	12	125	28	488
Total	403	511	145	11	515	125	33	791	374	2,908

unit: case

Preparation of custom trays: CT, Preparation of inlays: IN, Preparation of crowns: CR, Preparation of bridges: BR, Preparation of metal cores: MC, Preparation of removable dentures: RD, Preparation of sprints: SP, Preparation of temporary crowns: TC

Term 1, probably because the trainees in the previous year tried to finish treatment by the end of their residency in March, and because the number of patients distributed to the Department of General Dentistry after preliminary examinations was low in April, which was in Term 0, as only instructor dentists were on duty and more patients were assigned to them.

When the number of dental residents increased to 35 or above, the mean number of patients per resident decreased, presumably because the number of patients used by instructor dentists for resident training was limited. This suggests the necessity for evaluation of appropriate numbers of instructors and residents to make clinical training more efficient.

2. Contents of clinical activities

Compared with the data concerning Japanese dentists in general in June observed in the national statistics in the Social Medical and Clinical Actions in 2004⁹⁾, the number of periodontal treatments was slightly lower, and the numbers of endodontic treatments and removable prosthetic treatments were slightly higher, but the differences were not marked⁹⁾. This suggests that the goal of clinical training, *i.e.*, “acquiring basic diagnostic and therapeutic abilities so that trainees can appropriately handle injuries and diseases commonly encountered in general clinical practice”, was attained. Periodontal treatment accounted for about 40% of all treatments, probably because periodontal disease is prevalent. Periodontal treatment is a basic process in dentistry along with treatment of caries. Therefore, as pre-treatment, periodontal examination, scaling and tooth brushing instruction, in particular, are necessary to ensure a favorable outcome of dental treatment.

Numbers of periodontal treatments, restorative treatments, removable prosthodontic treatments and oral surgical treatments generally increased with time between 2003 and 2007. This is considered to be a reflection of a positive attitude of the dental residents toward clinical training.

In the future, we would also like to perform formative evaluation of clinical actions of dental residents using an evaluation chart such as that devised by Kishi *et al.*¹⁾.

3. Number of technical tasks

In 2006–2007, bridge preparation was performed for only 1 patient, which is a serious problem. This is considered to have been due to the fact that relatively simple prostheses could be prepared by the residents themselves, who treated patients on a weekly basis, but more complex and time-consuming technical tasks had to be ordered to outside agents. It is difficult to reconcile clinical work with the performance of technical tasks, so the number of technical tasks performed by a trainee will depend on which activity is emphasized during clinical training. According to the present principle of “placing emphasis on allowing trainees to experience many clinical cases”, sacrificing the number of technical tasks is considered unavoidable to some extent. However, it is indispensable for a dentist to acquire the knowledge to enable them to give appropriate instructions to dental technicians and the ability to properly assess the prepared prostheses. More intensive instruction in technical tasks may be necessary during clinical training in the future to compensate for this lack of experience in technical tasks.

Conclusion

This study revealed problems that must be evaluated and resolved concerning securing number of patients, widening variety and improving appropriateness of cases and increasing number of technical tasks to improve clinical training. It is necessary to continue monitoring the state of clinical training at the Department of General Dentistry, Chiba Hospital by collecting and analyzing data concerning the number of patients, contents of examination and treatment and technical tasks experienced by dental residents during each term and year of clinical training.

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