

A system to classify the need for periodontal treatment

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A system to determine the periodontal therapeutic needs of a population — the Periodontal Treatment Need System (PTNS) is suggested. It is based on defined diagnostic criteria and systematize the needs according to three standardized therapeutic procedures: (1) individual oral hygiene motivation and instruction (OH), (2) scaling and elimination of overhangs (Sc) and (3) periodontal surgery (Su). The classification is: Class 0 — no need, Class A — need for OH, Class B — need for Sc and OH, and Class C — need for Su, OH and Sc. Class A is given for the *mouth* and Classes B and C for *quadrants*. To evaluate the application of the system, 42 patients were treated for inflammatory periodontal disease. The therapy consisted of OH, Sc and Su. The time used for performing the treatment was recorded in each session. The patients were classified according to the system and the average time for each type of therapy was: OH — 72 minutes per patient, Sc — 32 minutes per quadrant and Su — 57 minutes per quadrant. The following guidelines were suggested for the PTNS: Class A — 60 minutes, Class B — 30 minutes and Class C — 60 minutes. The PTNS offered the possibility of estimating the type(s) of treatment needed and the time required for performing it. Thereby, manpower and costs may be calculated. The system appeared to be reproducible and may be useful in planning of periodontal treatment for population groups.

Key-words: Public health; periodontics; periodontal index; epidemiology

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At present a great need exists to develop better methods of delivering treatment in order to control oral disease (Harris, 1972). Prevention and treatment of caries and periodontal disease constitute the highest requirements for manpower and economic resources in dentistry.

Clinical trials have shown that periodontal disease can be controlled by the removal and control of plaque and calculus (Lövdal *et al.*, 1961, Löe, Theilade & Jensen, 1965; Theilade *et al.*, 1966, Ramfjord *et al.*, 1968, Suomi *et al.*, 1969, 1971a,

1971b; Lightner *et al.*, 1971; Suomi 1971). In spite of this, periodontal disease has received only limited attention from the dental profession and the health services. Thus, periodontal therapy represented less than 3 % of the total dental health services rendered to the USA population (Masters, 1967). Furthermore, periodontics is restrictedly or not at all included in prepayment programs in USA (Ryan, 1967). An inquiry among employees in Oslo showed that of the total dental services rendered, less than

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6 % was periodontal treatment (Bellini, 1973).

This paper is concerned with the planning of periodontal treatment delivery.

The difficulties in converting numerical epidemiologic parameters into treatment time evaluation have been discussed (Greene, 1967; Bellini, 1973). No reliable association between treatment time and epidemiologic parameters was found (Bellini, 1973). Consequently, it seems mandatory to develop a system which makes it possible to assess the necessary treatment and the time required for performing it.

Any delivery system must provide realistic pictures of the need for prevention and therapy, including estimations of manpower and resources involved. The following requirements must be fulfilled.

1. The method should be useful for evaluating the need for periodontal treatment.

2. The therapeutic procedures should be classified and related to time.

3. A basis for calculation of manpower and costs in delivering the necessary treatment should be provided.

4. The method should be simple and quick in field studies.

The purposes of this study were to present the Periodontal Treatment Need System (PTNS) and to evaluate the system.

METHODS AND MATERIAL

The Periodontal Treatment Need System — PTNS

The system is based on an evaluation of the need for 1) Motivation and oral hygiene instruction (OH), 2) Scaling and

elimination of overhangs (Sc), 3) Surgery (Su) and on the time needed to perform the various types of treatment.

Classification

Class 0 — no treatment needed

Class A — motivation and oral hygiene instruction

Class B — scaling and removal of overhangs

Class C — surgery

In Class A, only one classification is needed for the whole mouth and can be given alone or together with the other classes.

For Classes B and C, each quadrant in the mouth is scored separately. A quadrant is defined as a segment containing 4—8 teeth. Less than 8 teeth in one jaw is considered as one quadrant. Four teeth or less in the mouth are recorded as one quadrant.

Criteria for classification:

Class 0 — patients with no clinical signs of inflammation. The location of the gingival margin is disregarded.

Class A — all patients needing any kind of periodontal treatment are grouped here. In the presence of gingivitis and supragingival plaque only (no calculus nor overhangs), the *patient* is classified only in this class.

Class B — in this class each *quadrant* with one or more pathologic pockets 5 mm deep or less, is included. The registration of one quadrant in this class implies that Class A must be added.

Class C — in this class each quadrant with one or more pathologic pockets deeper than 5 mm is recorded. Any quadrant classified as C will also require Class A and B treatment.

The criteria for classification are presented in Table I.

Table I. *Criteria for the Periodontal Treatment Need System (PTNS) classification*

PTNS classification	Unit	Plaque	Calculus and/or overhangs	Inflammation	Pocket depth
Class 0	mouth	no	no	no	not considered
Class A	mouth	yes	no	yes	< 5 mm
Class B	quadrant	yes	yes	yes	< 5 mm
Class C	quadrant	yes	yes	yes	> 5 mm

Scoring procedure

A periodontal probe and a mouth mirror are needed.

Instructions for use

Define the number of quadrants.

Probing: Start from the most distal tooth in the upper right; EACH tooth is probed on ALL SURFACES in all quadrants. When a pocket deeper than 5 mm is found, the quadrant is given the score C. In case there is no such pockets, give score A in the presence of plaque and gingivitis and score B in the presence of calculus and/or overhangs.

Comments: Only »true pockets» (pockets due to loss of attachment) on the distal surface of last molars give the score C for the quadrant.

A pocket deeper than 5 mm mesially to the central incisors does not give score C when it represents the only »C pocket» in the quadrant, provided C is scored for the other quadrant in the jaw.

Experimental material

The material comprised 42 patients, 24 to 53 years of age, applying for dental treatment at the Dental Faculty, University of Oslo. They represented different stages of periodontal disease. No attempts were made to establish a proportion between sexes, number of patients or severity of periodontal disease.

Scoring methods

At the start of the experiment, all the patients were scored for Plaque Index (P.I.) (Silness & Løe, 1964), Gingival Index (G.I.) (Løe & Silness, 1963) and Calculus Index (CI) (Greene & Vermillion, 1960). The patients were also classified according to the Periodontal Treatment Need System (PTNS). One month after the treatment was completed the patients were again scored for P.I. and G.I. CI was not recorded, since absence of calculus was one of the conditions required for considering the treatment finished. One out of two calibrated dentists carried out the scorings. Pocket depth was measured with a periodontal probe by the same periodontist who performed the treatment, at the start and one month after the treatment.

Time scoring: Time was measured from the moment the dentist started to wash his hands till the treatment procedure was ended. Preparations of the equipment, of the instruments and the appointments, were made by the chairside assistant and the time was not considered as treatment time. The time for each procedure (OH, Sc and Su) was recorded in each session. For OH the time was recorded for each individual and for Sc and Su the time recording was for each quadrant.

Treatment procedures

Individual treatment plan was made by

Table II. *Classification of 42 patients*

PTNS classification	Patients' distribution				Total
	Group I	Group II	Group III	Group IV	
Class 0 (persons)	—	—	—	—	
Class A (persons)	1	10	21	10	42
Class B (quadrants)	—	38	82	38	158
Class C (quadrants)	—	—	36	38	74

I: only Class A was needed

II: Class B in all quadrants

III: Class B in some quadrants and C in others

IV: Class C in all quadrants

the therapist for each patient, based on a clinical examination, including periapical radiographs of the whole mouth. Further details with regard to the criteria and treatment procedure were given previously (Bellini, 1973).

A trained periodontist and a chairside assistant treated all the patients.

RESULTS

The 42 patients included 1 individual classified as Class A, 10 individuals Class B, 10 individuals Class C and 21 individuals with some quadrant(s) B and other quadrant(s) C (Table II).

The average time required per patient for motivation and instruction in oral hygiene was 72 minutes (Class A). For

scaling and elimination of overhangs, the mean time per quadrant was 32 minutes (Class B) and per tooth (the total time per mouth divided by the number of teeth), 5 minutes. For surgical procedures, the mean time per quadrant was 57 minutes (Class C), and per tooth, 11 minutes. Table III presents the averages for each type of treatment as well as the percentage of the total time for each class.

The variation in the time spent for Sc and Su is shown both per quadrant and per tooth in Figs. 1, 2, 3 and 4. The distribution of the patients according to the time used for motivation and oral hygiene instruction is visualized in Fig. 5.

The average OH time per individual and the Sc, Su time per quadrant were then introduced in the PTNS classes.

Table IV presents the total time

Table III. *Treatment time averages for motivation and oral hygiene instruction (OH), scaling and elimination of overhangs (Sc) and surgery (Su)*

Procedure	Number of patients	Total time in minutes (%)	Mean time per person in minutes	Mean time per quadrant	Number of quadrants	Mean time per tooth in minutes	Number of teeth
OH	42	3026 (24.5)	72				1001
Sc	41	5125 (41.6)	125	32	158	5	975
Su	31	4185 (33.9)	135	57	73	11	366
Total	42	12334 (100.0)	294				1001

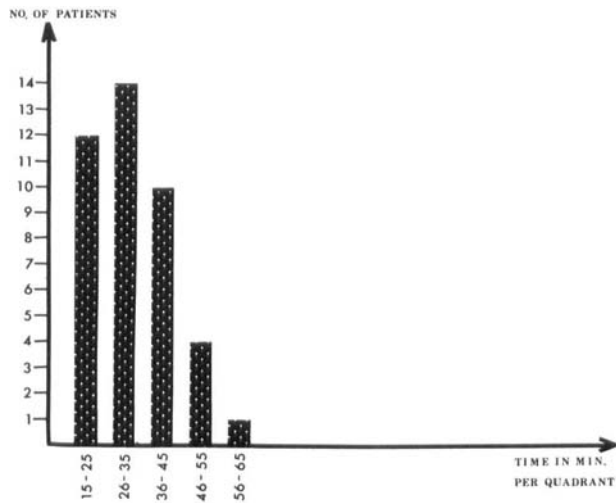


Fig. 1. Distribution of the patients according to the average scaling time per quadrant.

Table IV. The PTNS treatment time in 42 patients

PTNS classification	Time in minutes (%)	PTNS units
Class A	3024 (24.7)	42 persons
Class B	5125 (41.6)	158 quadrants
Class C	4185 (34.0)	73 quadrants
Total	12334 (100.0)	

calculated for each procedure in the 42 patients.

The time averages were applied to the patients' groups (Table II), and a considerable increase in time was found with increased severity of disease. This increase appeared to be geometric rather than arithmetic (Fig. 6).

The initial classification of the patients according to the PTNS was compared to the PTNS classes obtained after thorough registration of the pocket depth for treatment planning. Only in five out of the 158 quadrants examined a difference

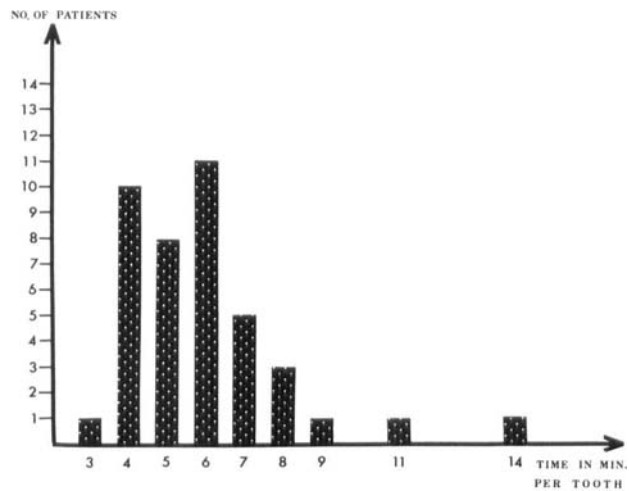


Fig. 2. Distribution of the patients according to the average scaling time per tooth.

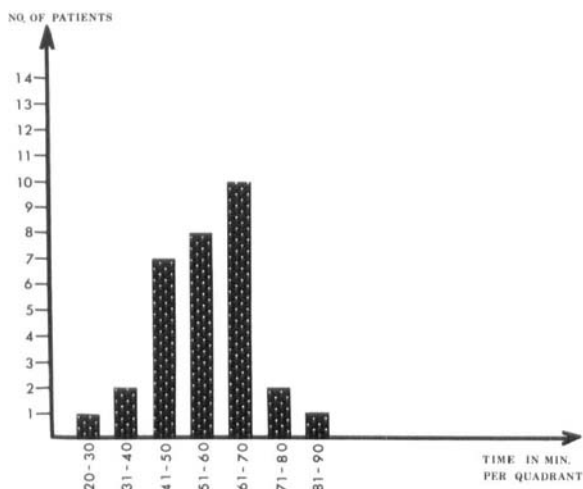


Fig. 3. Distribution of the patients according to the average surgical time per quadrant.

was found. Thus, discrepancies were observed in only 3.2 % of the quadrants.

The average P.I.I. for the patients was 1.21 at the start and dropped to 0.19 one month after treatment, G.I. of 1.40 to 0.78, and pocket depth of 2.83 mm to 1.83 mm. The average CI at the start was 2.01 and no calculus was diagnosed one month after the treatment (Fig. 7).

DISCUSSION

Reproducibility is one of the prerequisites for the validity of a system. In this connec-

tion, the PTNS was satisfactory, since the initial examiners and the therapist gave the same scores in 97 % of the quadrants. This seems to back the reliability of the system in field studies. The simplicity of the PTNS indicates that it may be practiced by any person trained in the diagnosis of gingivitis, dental deposits and periodontal pockets.

It is difficult to establish definite treatment time averages from this study. However, the results show that standardized diagnostic criteria and treatment procedures may allow the use of certain

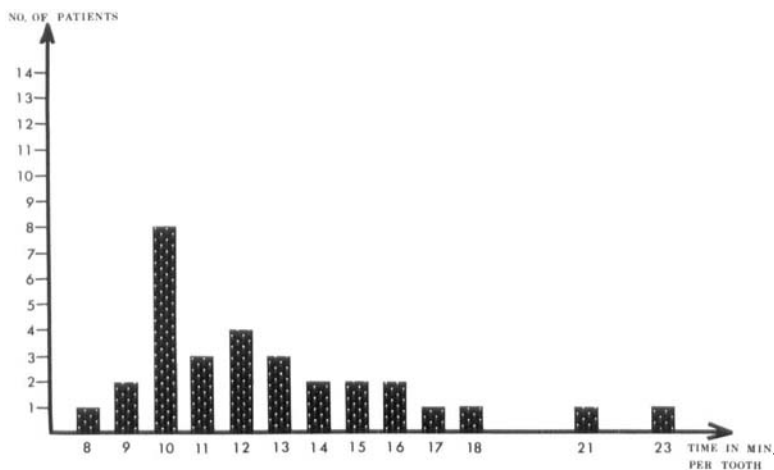


Fig. 4. Distribution of the patients according to the average surgical time per tooth.

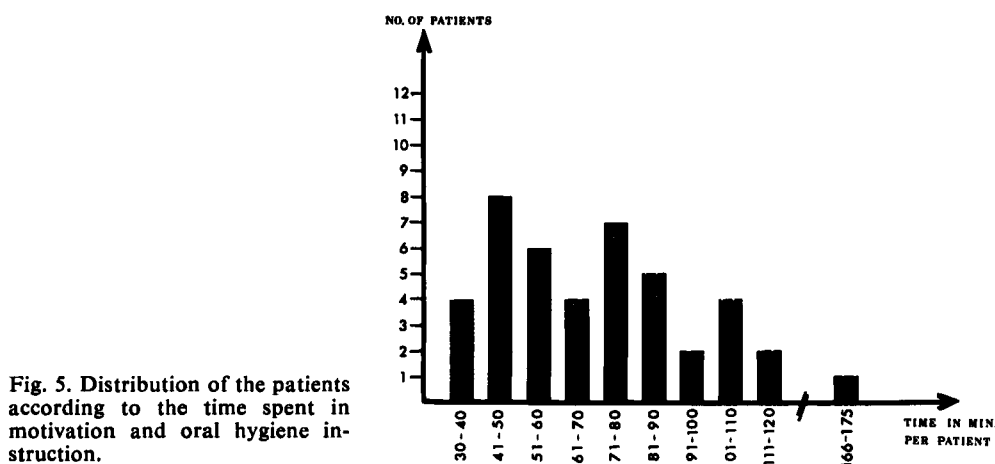


Fig. 5. Distribution of the patients according to the time spent in motivation and oral hygiene instruction.

averages in calculating the need for periodontal treatment.

The following approximations may be used as guidelines:

- Class A — 60 minutes (clocked time 72 minutes)
- Class B — 30 minutes (clocked time 32 minutes)
- Class C — 60 minutes (clocked time 57 minutes)

Thereby the time range of the PTNS is from 1 to 7 hours per patient.

In the group treated in this experiment, the total time could be estimated, as suggested in Table IV. Thereby, having the total treatment time, as well as the time for each class, manpower and costs can be calculated, according to the regional availability of personnel and salaries.

It should be noted that the time needed for examination was not included in this estimate.

The PTNS estimates both the type of treatment and the corresponding time required. This combination gives flexibility to the system and permits evaluation of different alternatives of manpower and time averages. In this study, one dentist

and one chairside assistant constituted the manpower. Time averages were determined from their work. However, different working conditions and personnel may be available in different locations. Therefore, other time averages may be required in the calculations. The PTNS therapy classification allows optative estimations of the personnel needed, when e.g. dentists, dental hygienists and chairside assistants are available. Moreover, the time averages can also be determined or corrected for varying working conditions (group motivation and instruction in oral hygiene, use of audiovisual resources, etc.).

To standardize the experimental conditions only one dentist performed the treat-

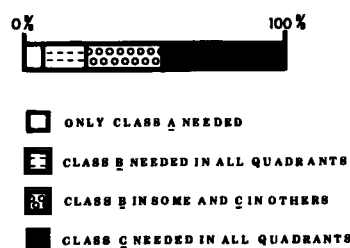


Fig. 6. Percentage of total time required to treat the patients of the four groups classified in the Periodontal Treatment Need System (PTNS).

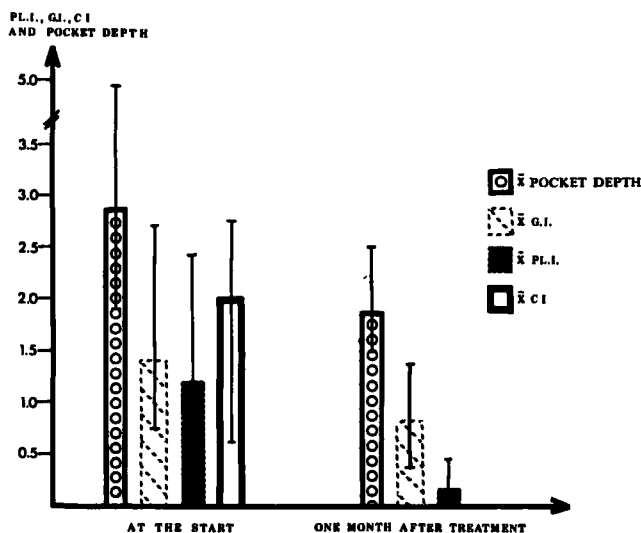


Fig. 7. Plaque Index (P.I.), Gingival Index (G.I.), Calculus Index (C.I.), mean pocket depth, and ranges at the start of the treatment and one month after.

ment in the studied group. Thus, it would be of interest to compare the time averages obtained in this study with the results obtained from a number of dentists.

The evaluation of periodontal treatment results includes controversial views (Glickman, 1972; Prichard, 1972). Little is known about success or failure expressed by the periodontal indices (Ramfjord, 1969). The plaque, calculus, gingival and pocket depth scores presented at the start and one month after treatment indicate that the periodontal condition of these patients improved to an acceptable level by the suggested treatment procedures.

The introduction of the PTNS seems encouraging, but additional studies are required to verify the applicability of the PTNS in field studies.

Conclusions

1. The Periodontal Treatment Need System (PTNS) was proposed for planning periodontal treatment in public health dentistry. It indicates the type(s) of treatment needed and it gives an estimation of

the treatment time. Thereby manpower and treatment costs can be calculated.

2. The system appeared to be reproducible.

3. Time averages for motivation and instruction in oral hygiene, scaling and elimination of overhangs and surgical procedures were suggested as basis for estimations of manpower and costs.

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