Communication Between the Dental Laboratory Technician and Dentist: Work Authorization for Fixed Partial Dentures

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<u>Purpose</u>: A questionnaire was sent to laboratory technicians to determine the level of communication between dentists and dental laboratories in specific areas of the work authorization forms for the fabrication of fixed partial dentures.

<u>Materials and Methods</u>: A select number of dental laboratories were randomly chosen from the National Association of Dental Laboratories (NADL) for each of the 50 states. The questionnaire was mailed to the laboratory directors for a total of 199 dental laboratories. The survey asked questions pertaining to the following areas of work authorization: legibility and thoroughness of prescriptions, patient information, choice of materials for the prosthesis, design of the prosthesis, and shade description. For each question, the number of responses received was tabulated and converted to a percentage.

<u>Results</u>: Of the 199 laboratories surveyed, 114 (57%) responded to the questionnaire. Results from this survey suggest that there is lack of communication between dentists and dental laboratories through work authorization forms regarding choice of metal alloy, type of porcelain to be used, and choice of margin and pontic design for the prosthesis.

<u>Conclusions</u>: Information obtained from the responding laboratories included effectiveness of work authorization forms. There were some similar trends indicated by the large percentage of dental laboratories agreeing on lack of communication by the dentists as reflected by the work authorization forms.

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INDEX WORDS: dentist, communication, dental laboratory technicians, survey, work authorization forms, fixed partial dentures

PROSTHODONTIC TREAMENT requires the fabrication of a clinically acceptable prosthesis. Proper communication between the dentist and the dental technician leads to a well-designed prosthesis, a satisfied dentist, and a comfort-

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Copyright © 2006 by The American College of Prosthodontists 1059-941X/06 doi: 10.1111/j.1532-849X.2006.00086.x able professional working relationship between the dentist and the dental laboratory technician. The dentist's responsibilities to the technician include providing written instructions that specify the materials to be used for the prosthesis, and providing accurate impressions, opposing casts, and interocclusal records for articulation. Also, appropriate infection control procedures should be completed by the dentist for all materials sent to the dental laboratory. The dental laboratory has the responsibility of using the instructions and materials provided by the dentist in order to fabricate a prosthesis in a timely manner.

Prosthodontic educators have been concerned with the interaction between dentist and dental laboratory.¹⁻³ A survey of fixed prosthodontic laboratories revealed that technicians were often dissatisfied with the information provided on the work authorization.⁴ A 1991 survey of dental laboratories identified consistent complaints from dental technicians of inadequacies in the quality of clinical products they received, as well as insufficient information on the work authorization.³ In 1990, Goodacre⁵ offered specific recommendations for dental educators to address the ramifications and responsibilities of future dental practitioners with regard to the dental laboratory. In 1994, a program was developed to improve the quality of laboratory submissions and the returned product, facilitating laboratory communication.⁶

Recently, the American Dental Association has issued updated guidelines to improve the relationship between the dentist and the laboratory technician.⁷ These guidelines not only advance the communication between the laboratory and the dentist, but also the efficiency and the quality of care for the patient.

The communication between the dentist and the dental laboratory through work authorizations is crucial to a properly executed prosthesis. The dental laboratories are in a position to observe, via the work authorization form, whether the communication is effective in allowing them to proceed with the fabrication of the prosthesis. The purpose of this survey was to evaluate the communication between dentists and laboratory technicians through work authorizations for the fabrication of fixed partial dentures (FPDs) by looking at specific areas of these forms received by the technicians.

Materials and Methods

In April 2002, a questionnaire (Table 1) relating to specific areas of work authorization forms was mailed to the laboratory directors who were registered with the National Association of Dental Laboratories (NADL).

Five laboratories were selected randomly per state from the NADL listing; however, some states had fewer than five laboratories listed; therefore, only up to three laboratories were selected randomly for these states. Surveys were sent to a total of 199 laboratories. After a second mailing to the laboratories that had not returned the questionnaire within a 3-month period, 114 out of 199 laboratories responded, yielding a response rate of 57%. Of the 114 responding laboratories, 21 indicated that they did not participate in the fabrication of FPDs, yielding a response rate of 47%.

The survey covered 12 specific areas of the work authorization and included questions such as legibility, patient's age and gender, return date, type of prosthesis, choice of metal, alloy used, preferred marginal design, shade guide used, and the type of porcelain glaze used. The questions were pilot-tested on site by faculty members and in-house laboratory technicians before mailing them to the dental laboratories.

Results

For each question, the number of responding laboratories was tabulated and converted into percentages. The results are presented in Table 1.

Discussion

Laboratory work authorizations have been called the most frequently used and abused form of communication between the dentist and the laboratory technician.² A recent survey⁸ of dental laboratories looked at the work authorizations submitted by dentists. This study showed that the finer details of a work authorization form (such as choice of metal, finish line, contour, staining, and type of occlusion) are most often poorly provided by dentists. This could be due to incomplete undergraduate training in the area of work authorization writing or the dentists considering certain information in the work authorization sheet to be more important than other information. Additionally, the lack of details provided could be due to dentists' assumption that the laboratory will use certain materials or design the prosthesis in a specific manner.

In our survey only 26% of laboratories indicated that work authorizations are complete enough to perform their best service. Forty-six percent indicated that the average work authorization form contained only the minimum amount of information necessary to complete the task. Another survey⁹ of dental technicians similarly indicated difficulty in interpreting laboratory prescription requests by dentists. Clear and specific statements of work enhance the quality and cost effectiveness of technicians' efforts. When laboratory work is authorized, the prescriptions should incorporate all necessary parameters, particularly choice of materials and processing requirements. Eighty-five percent of the laboratory technicians revealed that dentists were communicating legibly between 50% and 100% of the time. Sixty-seven percent of the respondents cited lack of information pertaining to patient age and gender on work authorizations. Seventy-four percent of respondents reported that the return date on the prescription was indicated between 76% and 100% of the time.

Table 1. Questionnaire Sent to U.S. Dental Laboratory Technicians

Name of Dental Laboratory Instructions: Please circle the response that best applies to your laboratory's cases which you receive from dentists. You may <i>not</i> circle more than one response. All data collected will be kept strictly confidential and will not be identified by individual laboratories in any future publications or presentations. Thank you for your cooperation.		
The following questions relate to Fixed Prosthodontic cases received by your laboratory		
1. Which of the following best describes the average work authorization or prescription coming into your laboratory regarding your crown and bridge cases in general?	Responses (%)	
 (a) Is complete enough for you to provide your best service (b) Is lacking in customization or personalization (c) Contains only the minimum amount of information necessary to get the job done (d) Frequently requires a call to the dentist to get more information (e) Other. Please explain (One dental laboratory replied "all of the above") (One dental laboratory replied they have a custom design work authorization.) 	(26) (17) (46) (8) (2)	
No Response	(1)	
2. Are complete and legible to provide your best service?	Responses (%)*	
 (a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% 	(7) (7) (41) (44)	
3. Indicate the patient's age and gender?	Responses (%)*	
 (a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% 	(67) (15) (10) (9)	
4. Indicate the return date?	Responses (%)*	
 (a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% No Response 	(2) (4) (18) (74) (1)	
5. Indicate the specific type of prosthesis (i.e., Porcelain Fused to Metal Crown, All Ceramic Crown, Telescopic Coping, Full Metal Crown etc.)?	Responses (%)	
 (a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% 	(2) (1) (16) (81)	
6. Indicate the choice of metal alloy?	Responses (%)	
 (a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% 	(25) (20) (22) (33)	
7. Indicate a preferred margin design?	Responses (%)*	
 (a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% No Response 	(32) (19) (26) (21) (1)	
8. Indicate the type of pontic design?	Responses (%)	
 (a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% No Response 	(58) (19) (13) (8) (2)	

(Continued)

9. Indicate the shade of the fixed restoration?	Responses (%)*
 (a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% No Response 	(2) (1) (6) (89) (1)
10. Provide a diagram for staining?	Responses (%)*
 (a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% No Response 	(57) (27) (8) (8) (1)
11. Indicate the type of porcelain?	Responses (%)
 (a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% No Response 	(84) (4) (3) (8) (1)
12. Indicate the shade guide used?	Responses (%)*
 (a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% No Response 	(35) (5) (10) (48) (1)
13. Indicate the type of porcelain glaze?	Responses (%)*
(a) Less than 25% (b) 25% to 50% (c) 51% to 75% (d) 76% to 100% No Response	$ \begin{array}{c} (91)\\(6)\\(1)\\(0)\\(1)\end{array} $

Table 1. Continued

*Rounding error, does not equal 100%.

The majority of laboratories (81%) responded that the dentists had indicated the type of prosthesis they desired for the patient; however, nearly half the work authorizations received did not specify the metal alloy to be used for prosthesis fabrication. The choice of an alloy depends upon a variety of factors including cost, rigidity, castability, ease of finishing and polishing, corrosion resistance, compatibility with specific porcelains, and personal preference.⁹ Dentists have the legal and ethical responsibility for the selection of the alloys used.

Even though proper pontic design is more important for cleansability and good tissue health than the choice of materials used, 58% of the laboratories reported that dentists usually did not indicate the type of pontic design in their prescription. Less than half of the work authorizations indicated a preferred margin design. Dentists should be knowledgeable about the different margin designs for FPDs and must have the final margin configuration clear in their minds before tooth preparation is begun. The restoration subsequently can be designed by the dentist to accommodate various esthetic and functional schemes, and then delegated to the laboratory technicians to fabricate the restoration according to the needs of the patient.

Tooth shade information is essential to the dental technician. Approximately 90% of the laboratories were satisfied with instructions given to them indicating the shade of the fixed restoration, although 84% of the respondents noted that the type of shade guide was not usually mentioned. A diagram of a tooth that allows specification of multiple shades is very helpful to the dental technician, especially in the fabrication of crowns in the anterior region. For example, by designating a cervical shade, an incisal shade, and proper individual characterization, a crown can be fabricated that closely matches the patient's dentition. Fiftyseven percent of the laboratories reported that dentists did not usually provide a diagram for staining. Once the desired contour and occlusion

have been achieved, the restoration must receive a surface treatment such as autoglazing, overglazing, or polishing.¹⁰ Ninety-one percent of the laboratories reported that dentists usually did not indicate the type of porcelain glaze. Eighty-one percent of the laboratories reported that dentists typically indicated to the technicians the specific type of prosthesis needed for the case, yet 84% did not usually mention the type of porcelain. This responsibility should not be delegated to the dental laboratory technician.

Most dentists rely on the dental technician to choose the materials needed for the fabrication of the prosthesis. With lack of adequate information, all too often the design, fabrication, and completion of the case is left up to the technician. Therefore, our results indicate an apparent trend in which technicians are left to make crucial decisions for dentists.

Conclusions

A survey of dental laboratories was conducted to examine the communication between the dentist and the dental laboratory pertaining to FPDs. Information obtained from the responding laboratories considered the effectiveness of work authorization forms. Trends were indicated by the large percentage of dental laboratories citing lack of communication by the dentists, as reflected by the failure of work authorization forms to indicate patient's age and gender, choice of metal alloy used, preferred margin design, type of pontic design, diagram for staining, as well as type of porcelain, shade guide, and type of porcelain glaze used.

According to the results obtained, it is recommended that work authorization forms contain specific information requested by the laboratory so better communication can occur between the members of the team. The information requested should include but not be limited to

- 1. The name, gender, and age of the patient;
- 2. The date of the request;
- 3. A detailed description of the work necessary and a diagram of the design, if appropriate, for the prosthesis (margin design, pontic design);
- *4.* The specific type of materials to be used in the construction of the prosthesis;

- 5. The shade of the prosthesis and the shade guide used;
- 6. Information regarding customization in staining, if applicable;
- 7. The type of occlusal scheme; and
- 8. The signature, license number, and telephone number of the requesting dentist/specialist.

The interaction between dentists and dental laboratory technicians has been a subject of concern for prosthodontic educators.^{1,11,12} Lack of communication has been cited as a major problem in providing optimum patient services.^{5,8} In 1990, Goodacre offered specific recommendations for dental educators to address the ramifications and responsibilities of our future dental practitioners with regard to the dental laboratory. In response to these recommendations, Nimmo⁶ described a curriculum where students evaluated their work prior to sending it to the dental laboratory and wrote work authorizations in an effort to improve the quality of work and to communicate effectively with the dental laboratory. This program was highly effective in educating the dental students about the importance of proper work submissions and work authorizations to the dental laboratory.

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