Improvement in Medical Consultation Responses with a Structured Request Form


Abstract: Physicians often do not provide adequate information regarding patients' medical conditions when presented with consultation requests (CR) generated by dental students and their instructors about the students' patients. We hypothesized that a structured CR form, which requests specific information by providing a checklist and/or closed-ended questions for physicians to answer, would lead to better communication and improved responses. We also hypothesized that providing in-service education to clinical faculty on the conditions that require and don't require CRs would reduce the number of unwarranted CRs sent to physicians. We assessed the responses obtained with the new form and compared them to findings over a similar period using our older, unstructured CR forms. We also evaluated the numbers of CRs written unnecessarily during both time periods. Improvements in the appropriateness of information provided by physicians were noted with the new CR forms for diabetes mellitus, hypertension, heart murmur, and anticoagulant therapy. The number of CRs written for conditions that did not need a consultation was approximately the same after provision of instruction as before. We conclude that structured CR forms improve the flow of information between dentists and physicians and should enhance student knowledge and skills in soliciting relevant information. Greater efforts must be taken to inform clinical faculty about the indications for CRs.

As the dental patient population becomes more medically complex and oral health care providers become more actively involved in screening and detecting early signs of prevalent medical conditions such as hypertension and diabetes, it is frequently necessary to communicate with other health care providers, mostly physicians, regarding patients' health conditions that affect dental care and/or need early medical intervention. This form of communication, traditionally called medical consultation, has been done in many informal ways such as phone calls. However, for efficiency, confidentiality of patient information, and record keeping, written consultation is most commonly used in dental teaching facilities.

Unfortunately, many consultation requests (CR) simply ask the physician for “medical clearance,” “any contraindications for dental care,” or “guidance in dental care.” This occurs in dental practice and dental educational facilities despite years of advocacy by oral medicine educators calling for dentists to exercise clinical judgment in providing dental care to medically complex patients. One reason that this practice persists is lack of knowledge on the part of dentists as to what information is relevant to request and how to write the request. As a result, medical consultation requests often yield inadequate answers or no information from the physicians. Some CRs are issued for medical conditions that do not warrant them. This delays patient treatment and many times generates physicians’ responses that conflict with current guidelines. The root cause of these unnecessary consultation requests is lack of familiarity on the part of some dental faculty with the diseases that impact dental care versus the conditions that do not, as well as the current guidelines and best available evidence.

The consultation request should be concise, containing only pertinent and specific questions for the physician to answer. Once the information is obtained, the dental practitioner should be able to make adequate management decisions. Consultations...
should be requested only for legitimate reasons. For example, a heart murmur can indicate valvular disease resulting from previous infective endocarditis, which warrants antibiotic prophylaxis and needs to be verified through consultation. Specific data provided by physicians are sometimes needed to assess the status of a patient’s disease, such as glycosylated hemoglobin levels in diabetes or INR values in patients taking oral anticoagulants.

At one dental school, deficiencies in all of these aspects had been frequently identified when patients returned for treatment after consultation and the physicians’ responses were not satisfactory. Patient care was often delayed needlessly as pertinent information had to be obtained by resubmitting consultation requests or contacting physicians by telephone. In addition, delays occurred when consultations were sent for medical conditions that did not warrant them with respect to dental care, because when medical consultations are issued, many times patients would be put in “medical hold” status and no elective dental treatment would be rendered. These problems had been known to all faculty members in the Department of Diagnostic Sciences as negatively affecting dental education and patient care.

Corrective measures were initiated by examining the consultation process. The existing CR forms (Figure 1) were unstructured, requiring self-composition of the requests by dental students and their faculty instructors. After identifying medical conditions that they believed required consultation with a physician, the students would draft the request and present it to the faculty member, who would review it or make changes and sign it. Two major problems were identified: many CRs failed to ask specific questions, and some were issued for irrelevant medical conditions.

In an attempt to correct these problems, we replaced the unstructured CR forms with structured preprinted CR forms (Figure 2) that used checklists and closed-ended questions to solicit information about the following medical problems: high blood pressure readings, self-reported heart murmur, anticoagulant therapy, and diabetes mellitus. We provided in-service presentations to clinical faculty in which we informed the faculty members about these preprinted forms. We also informed the faculty of specific questions for other medical conditions, such as recent heart attack or chemotherapy for cancer. Preprinted CR forms are not made for some conditions, but are available online in the clinic manual. We updated the faculty on new developments, including the emergence of bisphosphonate-related osteonecrosis and guidelines for dental management, and new guidelines such as the American Heart Association guidelines for antibiotic prophylaxis for infective endocarditis. These educational sessions included an invitation to contact a faculty member in the Department of Diagnostic Sciences when still uncertain how to proceed with a CR.

The purposes of this investigation were to:
1) assess the appropriateness of physician responses in a survey of medical consultation letters regarding these four conditions that had been generated with our original forms;
2) assess the appropriateness of physician responses generated with our new CR templates;
3) compare physician responses when using the original unstructured and new structured CR templates; and
4) compare the number of unwarranted CRs written before and after the provision of guidelines as part of in-service presentations.

We hypothesized that the structured CR form would lead to a streamlined process of obtaining the appropriate information. With better communications between the dental faculty and our patients’ physicians through specific requests, physicians would provide data relevant to dental care. We also hypothesized that presentation of current guidelines about information that is not needed from physicians for dental patient management would reduce the number of unwarranted CRs written by our faculty.

Materials and Methods

The project was submitted to our university’s Institutional Review Board (IRB protocol number 0708-22). The letter from the board stated that “the human subjects application for this project underwent exempt review and was approved as minimal risk to subjects.”

In part one of the study, as part of a didactic course in oral medicine in 2003, third-year dental students were asked to provide the chart numbers of their patients for whom medical consultation requests had been sent to physicians using our original forms. The patient records were retrieved, and the copies of the CRs in the records were examined, along with the physicians’ responses (when present).

We evaluated the responses of the physicians for appropriateness through consensus. Criteria for this evaluation, based on current available evidence, included the following:
Medical Consultation

Consultant: ______________________________________
Address: ______________________________________

Date: ______________________

Patient: _____________________________ UDM Chart Number: ______

Clinic requesting medical consultation:
Emergency/Screening 313-494-6718
Surgical Services 313-494-6739

REASON FOR CONSULTATION

Dear Dr. ___________________________

Faculty Signature: ___________________________

RELEASE
I hereby consent to the release of my medical records to the University of Detroit Mercy School of Dentistry including any information regarding HIV status and infectious disease. I understand that this information will remain confidential.

Patient Signature: ___________________________

PHYSICIAN’S RESPONSE

Physician Signature: ___________________________

Date: ___________________________

Disposition

Faculty Signature: ___________________________

Date: ___________________________

Figure 1. The original consultation request (CR) form was unstructured, requiring students and faculty members to write their own questions to the physicians
Figure 2. An example of the new structured CR form for diabetes mellitus

Note that the request for information includes a standardized opening, in which the faculty member must specify the type of diabetes reported by the patient, and closed-ended questions for the physician to answer regarding the most recent HbA1c measurement and its date and the glycemic control goal for the patient.
1. Did the physicians provide the pertinent information (e.g., HbA1c levels for patients with diabetes mellitus, INR values for patients taking oral anticoagulants)?

2. Did they provide unnecessary information that was irrelevant to the patient’s condition (e.g., a statement of “no contraindication for dental treatment” instead of addressing the questions about the patient’s medical condition)?

3. Did they make erroneous recommendations that conflict with the current guidelines (e.g., prescription of antibiotic prophylaxis for pins or plates, implants in the bone, or patients with functional heart murmurs, or recommendation of inappropriate regimens)?

The number of unwarranted CRs was also tabulated, based on our consensus. These decisions were based on the nature of the conditions and the fact that they had no relevance to dental management, in view of current available evidence, or if clear guidelines for dental management for the specific medical condition already existed and the patient’s information was complete.

In part two of the study, third-year dental students in 2005 were asked to retrieve all consultation requests and responses for their patients that were included in the patients’ records during the first two years in which the new CR forms were used, which began in autumn 2003. The responses were tabulated for a variety of medical problems as described above. The appropriateness of the requests and physicians’ responses on the CRs was evaluated. These results were compared to the data recorded for CRs written in the old open-ended question format. The number of unnecessary CRs was tabulated and compared to the number from the first group of CRs, which had been sent before the presentation of CR guidelines during in-service sessions.

Chi-square analysis was used to evaluate the significance of difference in numbers of appropriate responses obtained on the old versus the new CR forms.

Results

Part One of the Study

The students provided the chart numbers of 329 patients for whom CRs had been sent on the original template for a total of 344 problems. The majority of consultation requests were written to request information regarding cardiovascular disease (212/344, or 61.6 percent). Within this broad category, most requests referred to hypertension (HTN) evaluation (80/212, or 37.7 percent), heart murmur (65/212, or 30.7 percent), and anticoagulant therapy (8/212, or 3.8 percent). These consultation requests were deemed justified.

Of the eighty CRs written regarding HTN, seventy were answered; no responses were received for ten patients. The majority of responses received (64/70, or 91.4 percent) were appropriate. The physicians evaluated the blood pressure and indicated their findings regarding the presence of hypertension. Of these sixty-four replies, twenty-three mentioned that the patient had HTN but was under control, twenty-one indicated that the patient needed increased dosages or additional anti-HTN medicines, eight reported that the patient was normotensive, three stated that the physician wanted to see the patient again before dental treatment, and nine added other comments about the cardiac status of the patient. Six responses (8.6 percent) were not adequate because no diagnosis or evaluation of the patient was reported. Four of these replies only stated that there would be no problems with dental treatment. One reply recommended IV sedation before extractions, and one stated that dental treatment should only be performed when the blood pressure was below 150/95.

Requests for information regarding heart murmurs yielded adequate responses in thirty-six of the sixty cases for which responses were received, or 60.0 percent. Fourteen patients were found not to have a heart murmur. In nine cases, a diagnosis was provided for an existing heart murmur, and in twelve replies, the physician gave a diagnosis and made the correct recommendation regarding the use of antibiotic prophylaxis. One response indicated that further evaluation was needed to diagnose the patient’s heart condition. Of the twenty-four inadequate responses (40.0 percent), sixteen (26.7 percent) did not list a diagnosis but recommended the use of antibiotics before dental treatment. Seven cases received no diagnosis but a recommendation not to prescribe antibiotics. One reply suggested an improper antibiotic regimen for the diagnosis listed. Five requests received no response.

Eight letters of consultation were sent on the basis of the use of warfarin anticoagulants. Two of the six respondents (33.3 percent) provided current INR (International Normalized Ratio) and/or PT values. However, both of them recommended that the patient discontinue the anticoagulant before dental appoint-
ments. The INR value for one of these patients was 1.3. Two other replies included the same recommendation, but did not list any coagulation values.

The second most frequent reason for consultation requests after cardiovascular diseases was diabetes mellitus, with forty-eight CRs or 14 percent of the total. Seven CRs were unanswered. Of the remainder, twenty-eight of forty-one responses (68.3 percent) provided HbA1c levels. A total of thirteen CR responses (31.7 percent) did not list this value. Although only twenty-eight respondents provided HbA1c values, this information had been specifically requested in thirty-four of the CRs.

Consultation requests were written twenty-five times for what appeared to be unwarranted reasons. Table 1 summarizes the CRs from the first group of patients using the old CR forms, before the presentation of in-service information on the need for CRs.

### Part Two of the Study

Consultation requests on the new forms were reviewed for 461 conditions in 393 patients. The most common medical condition for which CRs were written in the two years of the new form was diabetes mellitus, accounting for 113 of the 461 requests (24.5 percent). The new CR form consisted of a request to provide the most recent HbA1c level, along with the date of the test and the targeted HbA1c level. Of the 113 CRs written for diabetes, ninety responses were received. All responses (100 percent) included the requested information.

Hypertension was the second most frequent disease for which consultation letters were written; seventy-three of 461 requests (15.8 percent) concerned this disease. The new CR form asked if the patient had been diagnosed with hypertension (yes or no) and, if so, what was the most recent blood pressure reading and the treatment being given if hypertension was diagnosed. Although a large number of patients were hypertensive, fewer CRs were sent for hypertension because many patients had already been diagnosed with the disease and were undergoing treatment. Of the fifty-eight responses received on the new form, all (100 percent) provided a diagnosis and/or treatment regimen regarding hypertension. No response was received for fifteen CRs.

The revised CR form for heart murmur asked the physician to check boxes in answer to questions asking if the patient has a heart murmur and, if so, whether it is functional or pathologic. The physician was also asked to provide a diagnosis for pathologic heart murmurs. Requests for information regarding heart murmur were sent for sixty-seven patients (14.5 percent of all CRs) and yielded fifty-seven responses. Correct information was provided for fifty-two of the fifty-seven patients (91.2 percent). Seventeen of the fifty-two patients were found to have no heart murmur, and thirty-five had a confirmed heart murmur with the diagnosis provided. These CRs were sent during the era in which a pathologic heart murmur often had been used to identify patients for antibiotic prophylaxis, before the revision of the American Heart Association guidelines for prevention of infective endocarditis in 2007. The new guidelines clearly specify the patient categories for which antibiotic prophylaxis would be reasonable. There is no need to use heart murmur as a surrogate marker to identify patients for this purpose. This CR form is still valid for other significant ramifications of heart murmur.

Eighteen patients taking anticoagulants had consultations requesting the date and result of the most recent INR test. All of the fourteen responses to the new CR forms included this information, and two of these included the request not to withdraw warfarin therapy before the dental procedure. No response was received for four CRs.

Unwarranted consultations were written for twenty-eight conditions. Table 2 lists the CRs using the new structured forms, beginning with the period of time in which in-service education was provided to the clinical faculty.

A comparison of the results of consultation requests with the old and new CR forms is provided in Table 3. Chi-square analysis of the results indicates...
a significant difference in numbers of appropriate responses on the new CR forms compared to the old CR forms (p<0.0001). The findings were similar for CRs relating to heart murmur only (p=0.0001). Chi-square analysis could not be performed for the other CR categories individually because of the absence of inappropriate responses.

### Discussion

The patient’s medical condition may warrant modification in treatment decisions and should be clarified. Not all patients bring with them complete medical information, and not all self-reported medical histories are reliable.\(^\text{10}\) Teaching knowledge and skill in obtaining relevant information effectively and efficiently through medical consultation is an integral part of dental education. Students should also be aware of the liability issues regarding consultants’ responses to requests for patients’ medical information. The dentist who performs the procedure is ultimately responsible for his or her treatment decisions.\(^\text{11,12}\) It is the pertinent information rather than the physician’s opinion that is crucial in making evidence-based clinical decisions. In this project, we used the four most frequently sought consultations to demonstrate how structured CR forms can accomplish the goals of seeking specific and relevant information.

In the case of hypertension, the increase in appropriate responses from 91.4 percent of cases with the original forms to 100 percent with the new forms was somewhat small, perhaps because the required blood pressure readings are easy to access from patients’ medical records and questions about blood pressure are generally straightforward. In contrast, much greater improvements were achieved in CRs regarding diabetes mellitus, heart murmur, and anticoagulation therapy. During the two years of the first part of the project, in which the old CR forms were used, only twenty-eight of forty-one responses (68.3 percent) provided HbA1c results. This is due in part to the fact that some consultation requests (seven of the forty-one that were returned) did not ask for this data. Some clinical faculty may not have known the importance of HbA1c in monitoring diabetes control and its value in planning dental treatment and assessing prognosis.

### Table 2. Most common reasons for medical consultations, using the new CR forms

<table>
<thead>
<tr>
<th>Reason</th>
<th>Old</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cardiovascular diseases</td>
<td>204</td>
<td>28</td>
</tr>
<tr>
<td>Hypertension</td>
<td>73</td>
<td>10</td>
</tr>
<tr>
<td>Heart murmur</td>
<td>67</td>
<td>52</td>
</tr>
<tr>
<td>Anticoagulant therapy</td>
<td>18</td>
<td>14</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>113</td>
<td>28</td>
</tr>
<tr>
<td>Unwarranted consultations</td>
<td>28</td>
<td>10</td>
</tr>
<tr>
<td>Antiplatelet therapy</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Coronary artery stent</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Pacemaker</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Fibromyalgia</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Alzheimer disease</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Autism</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Hearing aid</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Parkinson disease</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

### Table 3. Comparison of results of consultation requests using old and new forms

<table>
<thead>
<tr>
<th>CR Reason</th>
<th>Old</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension</td>
<td>64 (91.4%)</td>
<td>58 (100.0%)</td>
</tr>
<tr>
<td>Heart murmur</td>
<td>6 (8.6%)</td>
<td>0 (0.0%)</td>
</tr>
<tr>
<td>Anticoagulation therapy</td>
<td>36 (60.0%)</td>
<td>52 (91.2%)</td>
</tr>
<tr>
<td>Heart murmur (provided INR)</td>
<td>24 (40.0%)</td>
<td>5 (8.8%)</td>
</tr>
<tr>
<td>Inappropriate information</td>
<td>2 (33.3%)</td>
<td>14 (100.0%)</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>28 (68.3%)</td>
<td>90 (100.0%)</td>
</tr>
<tr>
<td>Inappropriate information</td>
<td>13 (31.7%)</td>
<td>0 (0.0%)</td>
</tr>
</tbody>
</table>

For all CRs, chi-square=50.56, df=1, p<0.0001. For heart murmur CRs only, chi-square=15.3, df=1, p=0.0001.
included a request for HbA1c, it is possible that the request for this information on these forms was hidden among other language in the consultation request. Once HbA1c was added as a stand-alone item to the structured CR form, all requests that were returned included this value.

The number of consultation requests for diabetes increased more than twofold in the second part of the project. This could be due to increased awareness of the importance of diabetes in dental treatment among the faculty as the result of in-service presentations, as well as the new user-friendly CR form. Communication was clearly enhanced, to the benefit of the patient.

Requests for information about heart murmurs also elicited a much greater percentage of appropriate answers with the new CR form. Previously, twenty-three out of sixty replies contained no diagnosis, but included recommendations for antibiotic prophylaxis that may or may not have been correct. One response listed a diagnosis of the heart murmur, but suggested an antibiotic regimen that was incompatible with the diagnosis. It is preferable for dentists to obtain diagnoses from physicians and then use their own judgment about the need for prophylaxis on the basis of current evidence. This item is an especially valuable example of how the strategy in seeking information may change when the paradigm of medical practice shifts. Prior to the current AHA guidelines regarding the prevention of infective endocarditis, an organic heart murmur was often used as a surrogate marker to identify conditions for AP (antibiotic prophylaxis) because almost all heart conditions recommended previously for AP were associated with an organic (pathologic) heart murmur. The list of these conditions was very lengthy. An organic murmur thus had great clinical significance. However, there are functional (physiologic, innocent) heart murmurs that have no clinical significance. When a patient reports a heart murmur without further information, its clinical significance is somewhat ambiguous until the nature of this heart murmur can be clarified through medical consultation. The new CR form specifically calls for a diagnosis and includes a box in which physicians can indicate whether the murmur is functional or pathologic. This has greatly improved the quality of information about patients’ heart murmurs, with only five of the fifty-seven responses failing to provide requested information.

The current guidelines regarding the prevention of infective endocarditis, as released by the American Heart Association in April 2007, excluded many of the conditions associated with organic heart murmur from the list of conditions that are reasonable for AP, such as aortic stenosis and mitral valve prolapse (MVP) with regurgitation. Only a few conditions remain, such as previous IE (infective endocarditis) and the presence of artificial heart valves. By applying the principle of requesting specific information about a patient’s health by using closed-ended questions and checklists, it is much easier to request the specific heart conditions that are reasonable for antibiotic prophylaxis as provided by the new guidelines than to ask about heart murmur. The somewhat ambiguous significance of heart murmurs regarding AP for IE has been eliminated. (Other dental implications of heart murmur in dental care are not within the scope of this article.)

All fourteen of the replies to consultation requests about patients taking oral anticoagulants included the most recent INR value, as opposed to only two of six responses to unstructured CRs. While the numbers of these consultations are small and may not lend themselves to broad generalizations, it would appear that including a specific request for INR guided both the dental faculty member and the physician toward the desired information.

We were not as successful in reducing the number of unwarranted consultation requests: twenty-five unnecessary CRs were written before in-service presentations were made available to faculty, and twenty-eight were written during and after these presentations. It is possible that some of these requests were issued by faculty who had not attended the presentations or that some were written for conditions that were not directly mentioned in the in-service sessions. Clinical faculty members serve as role models for dental students and have great influence in students’ learning. It is therefore highly desirable that faculty members remain up-to-date regarding the need for CRs to help instill proper practices in the students.

Since the initiation of the in-service presentations, the dental school has placed the clinical manual on a website for ready referral by all faculty members. We have included the guidelines for requesting medical consultations in the manual, along with sections explaining which conditions call for a CR and some that don’t. We believe this will help reduce the number of needless CRs in the future.
Conclusions

The introduction of structured medical consultation request forms for high blood pressure, heart murmurs, anticoagulant therapy, and diabetes mellitus led to improvements in obtaining the appropriate information provided by physicians. Provision of in-service presentations by diagnostic sciences faculty regarding how to construct a consultation request and the conditions that require or don’t require consultations was not as successful. However, it is difficult to directly link the effect of training to the writing of CRs as previously discussed since some faculty members did not attend the in-service education and not all medical disorders were addressed. With advancing medical knowledge leading to the development of new guidelines, there should be continued efforts to update knowledge and skills in communication with consulting professionals in obtaining important medical information so that clinical decisions in the best interest of patients can be made efficiently. The concept of asking the specific questions and checklist format for consultation letter is valid, even though the questions may change with the evolution of medical knowledge.

REFERENCES