Denture Group Visits: A Model To Improve Access to Care and Reduce Treatment Period for Dentures

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The “group visit” is a format in health care where treatment is delivered to a cohort of patients who require similar treatment.1–3 Group visits, also referred to as “cluster visits,” “shared visits” or “group appointments,” are utilized to discuss treatment procedures and outcomes with health care providers or auxiliaries in the presence of other patients. When necessary, individual sessions may also occur during group visits to discuss confidential matters. Group visits vary in length of time (a few minutes to hours) and frequency (single, biweekly or monthly visits).1,4

Most community/hospital-based dental centers treat patients who cannot afford the cost of private care. Without prompt and timely intervention, many dental cases can result in extraction. In the United States, periodontitis is the leading cause of edentulism in elderly populations.5,6 Because the burden of tooth loss and edentulism is higher for patients with a low socioeconomic status or patients with disabilities,7,8 these patients may also seek treatment in community/hospital-based dental centers. Removable dentures are the most economical way of restoring missing teeth. Group visits are widely used in medicine to treat patients with psychological disorders, diabetes, prenatal needs, chronic pain, etc.9–12 Group visits are more useful in addressing chronic medical conditions, wherein the patient not only receives the treatment needed but has the
ability to interact with patients with similar medical dental needs. These interactions may help motivate, decrease anxiety and improve clinical outcomes. Group visits have been used in dentistry for diabetes control and children’s well visits, either alone or as part of integrated medical services.

**Denture Group-Visit Logistics**

In 2011, the oral health department (OHD) within the Cambridge Health Alliance (CHA) established a biweekly program for patients needing removable dentures using a group-visit model. The OHD initiated denture group visits with the intent of increasing access to care by delivering treatment to more patients in a shorter time, decreasing provider chairside time and reducing the overhead cost of denture fabrication.

The schedule was designed with a biweekly (same day and time) 90-minute block for a denture group appointment. Eight to 10 patients were treated in a large conference room by one dentist and two dental assistants. The room was arranged in a rectangular fashion with three chairs and two tables positioned at the head of the room. Additional chairs were set up behind the tables for the remaining patients. There was one large cart with supplies and instruments and two smaller carts, one with paperwork and the other with lab cases. In addition, the room was equipped with a built-in sink and a computer to access patient charts. All instruments and lab cases were opened in front of the patients to reduce concerns regarding sterilization and disinfection. Patient privacy was protected and all patients signed confidentiality agreements, which were verified by a dental assistant prior to the start of each group visit session.

Each session began with the dentist discussing the denture treatment process, answering any questions and educating the patients about their oral health. The dentist then performed treatment on each patient in the same conference room in the order that they checked in. Patients could observe the procedure being performed on others and communicate any queries regarding the treatment with the dentist. Patients who did not show or canceled a group-visit appointment could choose the next available group-visit appointment. Because of this flexibility in selecting the next appointment date, patients usually were at different treatment stages. For example, one patient could be at the initial impression while another could be at the wax-bite. An individual appointment (in the dental operatory) was scheduled for any necessary denture adjustment procedures after denture delivery.

The patient chose the type of visit during their preliminary consultation for prosthodontic needs. The dentist explained the advantages and disadvantages of group visits and individual visits and answered any questions that could help patients make an informed decision. The patients could switch between group visits and individual visits at any time during the treatment process. Patients who chose individual visits were given appointments based on the availability in the schedule.
practice, individual denture appointments were scheduled for 30 minutes per session. Patients were given only one appointment at a time, regardless of group or individual visit status. This approach of one appointment at a time was warranted due to the high rate of missed appointments in community dental practices. The amount of time needed by the lab to complete each stage of the denture was the same for both group visits and individual visits. The clinic has four dentists — only the two dentists who provided dentures in both group and individual visits were included.

**Methodology**

This study was approved by the CHA Institutional review board. Data were collected by conducting a retrospective review of patient charts. For comparison purposes, the study pool was limited to patients who were treated by the two senior dentists. The patients selected for the final analysis received complete treatment (initial impression to delivery) and were treated exclusively in either group or individual visits.

**Chart Selection and Data Collection**

CHA transitioned from paper charts to electronic health records (EHR) in late 2013; therefore, only records from January 2014 through August 2016 were selected. Current Dental Terminology (CDT) codes and internal procedure codes were used to identify the patients who received treatment for traditional complete and removable partial dentures. CDT codes and procedure codes used were: initial impression (IMP), master impression (MIMP), wax-bite (WBITE), try-in (TRYIN) and denture delivery (using the appropriate CDT code). Denture group visits were identified in the patient record using the code (SHARED).

Two trained reviewers collected the data. The reviewers initially reviewed 30 patient charts for calibration and training. These criteria were established for inclusion in the study:

- Complete data or no ambiguity in the data for the treatment provided.
- Patients who received only complete or partial dentures.
- Patients who were treated exclusively by one of the two dentists for all the steps required to complete treatment.
- Patients who switched between group and individual visits for any of the denture procedures and those who received flippers and immediate dentures were excluded because these procedures may not require all the fabrication steps mentioned earlier.

**Variables Collected**

The type of visit, dental provider, number of calendar days for treatment, number of patient visits for treatment from initial impression to denture delivery and number of postdelivery denture adjustment visits were collected. The dental provider was denoted as either “Dentist One” or “Dentist Two” for the two senior dentists referenced earlier. The type of visit was dichotomized as group or individual. The patients who

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**TABLE 1**

Descriptive Characteristics of the Patients Who Received Dentures at the Cambridge Health Alliance

<table>
<thead>
<tr>
<th>Variables</th>
<th>All (n = 290)</th>
<th>Denture group visits (n = 206, 71%)</th>
<th>Individual visits (n = 84, 29%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>130 (44.83%)</td>
<td>93 (45.11%)</td>
<td>37 (44.05%)</td>
</tr>
<tr>
<td>Female</td>
<td>160 (55.17%)</td>
<td>113 (54.85%)</td>
<td>47 (55.95%)</td>
</tr>
<tr>
<td>Mean age</td>
<td>63.78 [62.38–65.18]</td>
<td>63.85 [62.2–65.5]</td>
<td>63.6 [60.9–66.29]</td>
</tr>
<tr>
<td>P = 0.87</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>114 (47.3%)</td>
<td>85 [49.7%]</td>
<td>29 [41.43%]</td>
</tr>
<tr>
<td>African American descendants</td>
<td>76 (36.51%)</td>
<td>64 [37.43%]</td>
<td>24 [34.28%]</td>
</tr>
<tr>
<td>Others</td>
<td>39 (16.18%)</td>
<td>22 (12.88%)</td>
<td>17 [24.29%]</td>
</tr>
<tr>
<td>P = 0.08</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public</td>
<td>223 (79.08%)</td>
<td>159 [79.1%]</td>
<td>64 [79%]</td>
</tr>
<tr>
<td>Private</td>
<td>59 (20.92%)</td>
<td>42 [20.9%]</td>
<td>17 [21%]</td>
</tr>
<tr>
<td>P = 0.98</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provider</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dentist 1</td>
<td>151 (52.07%)</td>
<td>102 [49.5%]</td>
<td>49 [58.37%]</td>
</tr>
<tr>
<td>Dentist 2</td>
<td>128 (47.93%)</td>
<td>104 [50.5%]</td>
<td>35 [41.63%]</td>
</tr>
<tr>
<td>P = 0.19</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Showing totals and proportions, except age mentioned in mean (95% CI).**
completed some of the steps for dentures but who ultimately did not get the dentures were collected as the variable “drop off.” The patients who dropped off the treatment were not included in the analysis for a shorter delivery time; instead, they were analyzed separately to check patient retention rates in both of the groups. Type of denture and number of dentures were collected as a combination of either complete dentures (CD) or removable partial dentures (RPD) and if the patient was receiving treatment for one denture or two dentures at the same time. Demographic information was also collected (age, gender, race and type of insurance).

### Statistical Analysis

Descriptive statistics of the distribution of the subjects in the two visit categories were calculated and compared using the Chi2 test for significance testing. For each group, comparison between the median days elapsed for the entire denture treatment, from initial impression to denture delivery, was investigated using a Mann-Whitney U test because the number of days for the treatment was positively skewed (FIGURES 1). Generalized linear model (GLM) regression analysis was conducted to analyze the association of the number of days taken for the treatment and the type of appointment and other covariates. We utilized a modified Park test to predict the square of the residuals as a function of the log of the dependent variable and identified that GLM gamma family was more appropriate. The inter-rater kappa was 0.82. Statistical analysis was performed using STATA version 13 (STATACorp LLC, College Station, Texas).

### Results

**TABLE 1** shows the descriptive statistics of the patient pool selected for this analysis. We identified 346 patients who needed dentures — 34 patients dropped off before denture delivery and an additional 22 were excluded because they switched between group and individual visits. A total of 290 patients were selected for the final analysis — 206 (71 percent) belonged to group appointments and 84 (29 percent) belonged to individual appointments. The mean age was 63.85 years (95% CI; 62.21–65.5) for group visits and 63.6 years (95% CI; 60.9–66.2) for individual visits. About 55 percent of the patients were female (113 in group and 47 in individual). Nearly 80 percent of the patients had public insurance and 20 percent had private. Of the patient charts included in the final analysis, 151 (52.07 percent) were treated by Dentist One and 139 (47.93 percent) were treated by Dentist Two. Chi2 and test of mean results for all the variables in **TABLE 1** showed no statistically significant difference between the population subgroups.

**TABLE 2** shows the results of the Mann-Whitney U test for the number of days, from the first appointment until denture delivery. The median number of days for group visits (71 days) for the entire treatment period (initial impression to denture delivery) is statistically significantly different (p < 0.002) than the median number of days in individual visits (93.5 days). The medians along with the means for the number of days are also represented.

**TABLE 3** contains the comparison of the drop-off rates for patients who discontinued the treatment in each group. The total number of patients who got treatment for dentures in either of the two visit types until they discontinued the treatment were included in this analysis. The Chi2 test shows a significant difference in the observed count and expected count for drop-off rates — 7.62 percent (n = 17) in group visits versus 16.83 percent (n = 17)
TABLE 4

GLM Log Link Regression Model: The Number of Days It Takes To Deliver the Denture and Its Association With Group Visits

<table>
<thead>
<tr>
<th>Number of days for denture (initial impression to delivery)</th>
<th>Exponential coefficients (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group visits</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Individual visits</td>
<td>1.32 (1.16–1.5)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Number of and type of denture</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single RPD</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>Two RPDs</td>
<td>0.99 (0.84–1.17)</td>
<td>0.98</td>
</tr>
<tr>
<td>Single CD</td>
<td>1.14 (0.95–1.38)</td>
<td>0.14</td>
</tr>
<tr>
<td>Two CDs</td>
<td>1.08 (0.92–1.26)</td>
<td>0.31</td>
</tr>
<tr>
<td>RPD and CD combination</td>
<td>1.28 (1.06–1.53)</td>
<td>0.007</td>
</tr>
<tr>
<td>Intercept</td>
<td>76.3 (68.03–85.56)</td>
<td></td>
</tr>
</tbody>
</table>

Exponential coefficients are shown.

Discussion

To our knowledge, this is the first time that a group-visit model has been applied to a clinical dental procedure for dentures. The philosophy of denture group visits is that patients with similar dental needs are scheduled together. These patients develop a mutually supportive unit that can help reduce anxiety, reduce negative social and psychological effects and provide moral support to each other. A dentist with good leadership skills and chairside manner can further initiate constructive changes in an individual patient while engaging all members of the group.

Discussions about oral and systemic health conditions within the group are encouraged, which can improve the health literacy levels among the patients. Patients have an opportunity to experience peer learning about oral health, tooth loss and potential complications encountered during or after the treatment through discussions with other patients and the dentist during the group appointment. In the group visit, dental tasks are streamlined relative to the target patients and the treatment methods. Group visits have shown to improve access to medical care, monitor high-risk patients and patients with chronic diseases. Other group visits that have been established at the CHA include infant/toddler, prenatal, diabetic and new patient orientation.

At the CHA, the addition of group visits did not cause any disruption to the daily work schedule of the dentist. After the 90-minute denture group-visit session, the dentist had appointments set for regular patients. The mean number of visits each patient had for a denture was 4.91 (95% CI 4.76–5.06). The mean number of visits for the group appointment was 4.98 when compared to 4.76 for the individual. The number of days needed to deliver a combination of CD and RPD was 27 percent days more when compared to a single RPD denture and was statistically significant (p = 0.007). This statistic may be attributed to some cases involving removable partial dentures that did not require all five steps as outlined from initial impression to delivery and faster delivery of the denture from the lab after fabrication.

Patient drop-off (discontinued treatment) and no-shows (missed appointments) produce a negative impact, especially in community health centers — lost revenue is associated with high patient drop-off and lost production is associated with high no-show rates. It is important to note that Medicaid regulations require that a denture must be delivered before reimbursement is requested. Our study has shown improved retention of patients in the group-appointment model when compared to the conventional individual appointment. Group-visit programs in medicine have demonstrated improved retention and patient adherence to the treatment process and lower hospitalization rates. The number of drop-offs between the groups was significantly different (TABLE 3). In this study, 17 out of 101 patients in individual visits (16.83 percent) and 17 out of 223
patients in shared visits (7.62 percent) dropped. The best predictors of a patient’s satisfaction with removable denture are appearance and retention. Postdelivery visits are used to address these issues if they exist. As the number of postdelivery visits and the median number of visits were not significantly different between the two visit types, we believe patients in the group visits were as satisfied as and the quality of denture was comparable to those receiving care in the individual visits.

Access to dental care has been a longstanding problem among low-income populations that comprise a higher number of the rural and inner-city populations in the United States. Access to dental care has many facets — the inability to see a dentist due to long wait periods is one important reason. Many community health centers are established on the noble mission of providing care for all, but unfortunately, in dentistry the need and demand for dental services are high, often resulting in long wait times. On average, it took 32 percent more days for an individual visit when compared to the group.

Group visits demonstrate the ability of the dentist to engage and treat multiple patients in a single session, deliver dentures in fewer days, increase patient retention rates and potentially open up additional chair time. This additional chair time increases utilization for individualized procedures for new and existing patients. For example, treating 10 patients in a 90-minute group session versus the five hours needed for these same patients nets 3 1/2 hours of additional chair time. This additional chair time increases utilization for individualized procedures for new and existing patients. For example, treating 10 patients in a 90-minute group session versus the five hours needed for these same patients nets 3 1/2 hours of additional chair time. We believe the additional chair time created by the group visits may also decrease the number of days for denture delivery for individual visits. Providing a large volume of denture cases also allowed the clinic to receive reduced rates from the dental labs.

Delivering dentures faster may also have a positive impact on the patient’s satisfaction and social acceptance. The transient nature of the surrounding community, the dependency on public transportation and the complex medical histories make it imperative to deliver dentures timely to use the momentum that has been established in the denture group.

Our study was conducted utilizing a retrospective review of patient charts and may have been impacted by missing information and potential confounders. The patients were not randomized into the two treatment groups. Although not randomized, the correlates of the characteristics of the patients were not statistically significant between the two groups. This study was conducted in a community/hospital-based community health center setting; therefore, the results may not be generalized to private practices, but we expect similar results, if not better. Because CHA transitioned to EHR in fourth quarter of 2013, denture treatment information prior to group-visit initiation was unavailable. Consequently, we were unable to compare the changes in the length of the treatment period for individual visits before and after group-visit project initiation.

Conclusion

The denture group visit is an innovative model to improve access to dental care by reducing the treatment period to deliver dentures. Using this model, we successfully reduced the number of days needed to treat a patient by 32 percent when compared to individual visits. Group visits are feasible in the dental setting and can result in decreased treatment length, improved access to care, increased treatment retention rates and increased revenue, while at the same time maintaining the quality of care.

The best predictors of a patient’s satisfaction with removable denture are appearance and retention.

REFERENCES

13. Weinger K. Group Medical Appointments in Diabetes Care: Is There a Future? Diabetes Spectr 2003;16(2).
17. Steven R G. Legal issues to be considered for Group Medical Visits. underbergkessler.com/sites/default/files/article_docs/Legal_issues_to_be_Considered_for_Group_Medical_Visits.pdf.

The corresponding author, Siddardha G. Chandrupatla, BDS, MMSc, can be reached at siddardhagowtam@gmail.com.

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