# What is the role of nutrition counseling in the management of isolated mandible fractures?

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**Objective.** Providing perioperative nutrition counseling may improve operative outcomes. It is unclear, however, whether this benefit translates to oral and maxillofacial surgery patients. The purpose of this study was to measure the effect of nutrition counseling on operative outcomes and patient satisfaction in those undergoing surgery for mandible fractures.

**Study Design.** The investigators implemented a retrospective cohort study. The predictor variable was perioperative nutrition counseling by a registered dietitian (RD). The main outcome variables were weight change, postoperative complications, and results of a survey that evaluated the perioperative experience.

**Results.** Statistical analyses were conducted on a sample of 200 patients (mean age: 34 ± 14 years; 87% males). Overall, there was no difference in percent weight change between those who received nutrition counseling and those who did not ($P = .46$). Those who received nutrition counseling had fewer postoperative complications (3% vs 11%; adjusted $P = .038$). Patients who received nutrition counseling from an RD were more satisfied with the nutrition advice they received ($P = .0375$).

**Conclusions.** The results suggest that perioperative nutrition counseling by an RD in the management of isolated mandible fractures has no effect on weight change but is associated with decreased postoperative complications and increased patient satisfaction with the nutrition advice they receive. (Oral Surg Oral Med Oral Pathol Oral Radiol 2019;128:464−471)

Providing perioperative nutrition counseling has been demonstrated to improve operative outcomes.[1-4] Adequate perioperative nutrition is critical to ensuring the patient's ability to tolerate the stress of surgery and to facilitating recovery. Although there has been extensive interest in perioperative nutrition for surgical patients in general, there has been less for those undergoing oral and maxillofacial surgery (OMS).[5-8]

In the management of mandibular fractures, current treatment practices limit patients to a liquid-only diet.[9] Subsequently, postoperative weight loss may be as high as 10 to 20 pounds, the highest loss occurring in postoperative week 1.[8,10,11] Without proper nutrition, the body breaks down protein to meet energy demands, resulting in a loss of lean body mass, delayed healing, prolonged rehabilitation, and reduction in wound strength, humoral immunity, and serum protein.[6,7,12-15] Proper perioperative nutrition is important and has an influence on how a patient will respond to surgery.[16] Improved perioperative nutrition may reduce length of hospital stay and enhance patient satisfaction.[17,18] Poor postoperative outcomes from nutritional depletion may increase overall health care costs.[19]

The purpose of this study was to measure the effect of nutrition counseling by registered dietitians (RDs) in the management of patients with isolated mandible fractures on operative outcomes and patient satisfaction. We hypothesized that nutrition counseling by an RD would not affect postoperative weight change, given that similar patients continued to lose weight even when given dietary advice; would reduce the frequency of a postoperative complications, given greater compliance with the recommended diet; improve patient satisfaction; and improve patients' ability to follow a recommended diet, given the interdisciplinary and patient-centered approach.[6] The specific aims were to (1) identify the role of nutrition counseling by an RD on patients' postoperative course and (2) conduct a survey regarding the nutrition counseling patients receive during the management of isolated mandible fractures.

## Statement of Clinical Relevance

In the management of isolated mandible fractures, nutrition counseling by a registered dietitian has no effect on weight but is associated with a decrease in postoperative complications and an increase in patient satisfaction related to the nutrition advice.

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## MATERIALS AND METHODS

We conducted an institutional review board−approved (University of Washington IRB #50845) retrospective cohort study. The study sample was derived from a population that presented to Harborview Medical Center (HMC, Seattle, WA), for evaluation and management of isolated mandible fractures between June 2010 and June 2015. Inclusion criteria were as follows:

1 Patients with isolated mandible fractures
2 Patients managed with open reduction and internal fixation (ORIF) (+/− maxillomandibular fixation [MMF]), closed treatment with MMF, or both
3 Patients with one or more postoperative visits
4 Patients with pre- and postoperative weight measurements
5 Patients age 18 years or greater

Exclusion criteria were as follows:

1 Patients previously treated for their fracture
2 Patients with alveolar fractures only

### Variables

The primary predictor variable was perioperative nutrition counseling by an RD, and the 2 groups were defined as the "yes" group (group 1) and the "no" group (group 2). The management of craniofacial trauma at the HMC is divided among 3 craniofacial services: OMS, Otolaryngology−Head and Neck Surgery, and Plastic and Reconstructive Surgery. Only the OMS service offers perioperative nutrition counseling by an RD.

Outcome variables included weight change, postoperative complication, and results of a 10-question survey. Weight change was the difference between preoperative and postoperative weights. Postoperative complication was defined as surgical site infection, wound dehiscence, osteomyelitis, or hardware failure. The survey (Figure 1), which was developed with the RDs at the HMC, comprised 1 question about whether or not perioperative nutrition counseling was provided by an RD, and the remaining 9 of the 10 questions assessed perceived weight change, satisfaction with perioperative nutrition counseling, and ability to follow a recommended diet.

Additional study variables included age; gender; race/ethnicity; tobacco, alcohol, and substance abuse; medical comorbidity; mechanism of injury; treatment method; and fracture location(s). "Alcohol use" was defined as heavy, moderate, or none, according to the *Dietary Guidelines for Americans.*[20] "Medical comorbidity" was defined as present or absent and included, but was not limited to, diabetes, hepatitis, morbid obesity, and immune system compromise (e.g., HIV/AIDS, immunosuppression).

### Data collection and analyses

Two methods of data collection were used: (1) chart review to collect data regarding the predictor, outcome, and additional variables and (2) survey administered to patients identified in the chart review regarding the perioperative nutrition counseling they received.

### Retrospective chart review

Data were obtained from medical records. Patients were divided into 2 groups: (1) those who received nutrition counseling by an RD (group 1) and (2) those who did not (group 2). A sample size analysis was performed to detect either an absolute difference in weight change of 5% at 2 weeks ($\alpha = 0.05$; Power = 0.8; $\sigma = 5$) or difference in complication rate of 2% ($\alpha = 0.05$; Power = 0.8; $\sigma = 5$). As such, patients were identified from the surgical schedule in reverse chronologic order until there were 100 patients in each group.

### Survey

Telephone-administered survey responses were input into an electronic spreadsheet. Survey administration was standardized through adherence to a script after obtaining consent.

### Statistical analyses

Descriptive statistics were used to describe the patients in groups 1 and 2. In the primary analysis, the chief interest was an association between nutrition counseling by an RD and percent weight change. Both univariate and multivariate analyses were performed. The multivariate analysis was conducted using generalized estimating equations with an independence working correlation. To control for the possibility of confounding, adjustments were made for gender; age; preoperative body mass index; days to follow-up; medical comorbidity; tobacco, alcohol, and substance abuse; type of MMF; and race/ethnicity. A 95% confidence interval (CI) was used. Sensitivity analyses were also performed.

In the secondary analysis, the chief interest was any association between nutrition counseling by an RD and postoperative complications. The complications within each group were described. Both univariate and multivariate analyses were performed. For the survey, in the multivariate analysis, each of the survey questions was fitted to linear regression models, where the outcome variable was the survey score and the predictor was whether the subject received nutrition counseling by an RD. Statistical analysis was conducted using "R" (R Core Team, Vienna, Austria). Statistical significance was set at $P < .05$.

1. **Did you see a nutritionist during the management of your jaw fracture?**

☐ Yes ☐ No

2. **I felt confident about following a diet that was appropriate given my jaw fracture**

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

3. **I was satisfied with the nutrition advice I was provided during the management of my jaw fracture**

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

4. **I felt comfortable following the recommended diet**

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

5. **It was easy to follow the recommended diet**

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

6. **I felt that it was easy to get enough to eat**

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

7. **I knew how many times a day I should eat.**

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

8. **I knew what kinds of foods to eat and/or drink?**

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

9. **My weight changed after surgery to fix my jaw**

☐ Gained ≥10 lbs ☐ Gained <10 lbs ☐ My weight didn't change ☐ Lost <10 lbs ☐ Lost ≥10 lbs

10. **I felt that I was able to eat a variety of foods**

☐ Strongly Disagree ☐ Disagree ☐ Neutral ☐ Agree ☐ Strongly Agree

Fig. 1. Ten-question patient experience survey questionnaire: perioperative nutrition counseling.

## RESULTS

### Characteristics of patients

The sample size was 200 patients. The characteristics of both study groups are summarized in Table I. In brief, mean age was 32 ± 15 years and 36 ± 14 for groups 1 and group 2, respectively ($P = .05$). In each group, 13 patients were females (13%). The most frequent mechanism of injury was assault (group 1: 61%, group 2: 52%; $P = .07$). Group 2 had higher rates of motor vehicle injury (group 1: 8%, group 2: 19%; $P = .07$). The most frequent intervention was ORIF (group 1: 84%, group 2: 87%; $P = .69$). Elastic MMF was used most frequently (49% in each group; $P = .0005$). Wire MMF was used more in group 1 (group 1: 24%, group 2: 6% in group 2; $P = .0005$). No postoperative MMF was used 27% and 45% of the time in groups 1 and 2, respectively ($P = .0005$). There were no statistically significant differences between the groups with respect to age, gender, race/ethnicity, comorbidity, tobacco use, alcohol use, substance abuse, or preoperative characteristics.

### Data analyses

In the primary univariate analysis (Table II), which looked at the association between nutrition counseling by an RD and weight change, without adjusting for confounders, those who received nutrition counseling by an RD had an average percent weight change that was 0.0054 greater than that in patients who did not

**Table I.** Descriptive statistics for patients and analysis of study variables grouped by nutrition counseling status

| | Total (n = 200) | Received nutrition Counseling by RD (n = 100) | Did not receive nutrition Counseling by RD (n = 100) | Unadjusted P value (from unequal variance t test or $\chi^2$ test) |
|---|---|---|---|---|
| **Age (years)**, mean (SD) | 34 (14) | 32 (15) | 36 (14) | .05 |
| **Male Gender** | 174 (87%) | 87 (87%) | 87 (87%) | 1.00 |
| **Race/Ethnicity*** | | | | .15 |
| White, n (%) | 125 (63%) | 56 (56%) | 69 (69%) | |
| Black/African American, n (%) | 35 (18%) | 22 (22%) | 13 (13%) | |
| Mexican (American)/Chicano, n (%) | 12 (6%) | 5 (5%) | 7 (7%) | |
| Other Race/Ethnicity, n (%) | 19 (9.5%) | 12 (12%) | 7 (7%) | |
| Missing race, n (%) | 9 (4.5%) | 5 (5%) | 4 (4%) | |
| **Any Comorbidity** | 76 (38%) | 37 (37%) | 39 (39%) | .77 |
| **Tobacco Use: Yes, n (%)** | 113 (57%) | 55 (55%) | 58 (58%) | .67 |
| **Alcohol Use** | | | | .76 |
| Heavy alcohol use, n (%) | 30 (15%) | 16 (16%) | 14 (14%) | |
| Moderate alcohol use, n (%) | 81 (41%) | 38 (38%) | 43 (43%) | |
| No alcohol consumption, n (%) | 89 (45%) | 46 (46%) | 43 (43%) | |
| **Substance Abuse: Yes, n (%)** | 64 (32%) | 34 (34%) | 30 (30%) | .55 |
| **Mechanism of Injury** | | | | .07 |
| Assault, n (%) | 113 (57%) | 61 (61%) | 52 (52%) | |
| Motor vehicle injury, n (%) | 27 (14%) | 8 (8%) | 19 (19%) | |
| Fall, n (%) | 30 (15%) | 18 (18%) | 12 (12%) | |
| Other, n (%) | 30 (15%) | 13 (13%) | 17 (17%) | |
| **Preoperative Characteristics** | | | | |
| Weight in kg, mean (SD) | 79 (17) | 80 (17) | 78 (16) | .37 |
| Height in meters, mean (SD) | 1.8 (0.088) | 1.8 (0.092) | 1.8 (0.084) | .63 |
| BMI, mean (SD) | 25 (5.3) | 26 (5.7) | 25 (4.9) | .40 |
| **Treating Service** | | | | < .0001 |
| Oral and Maxillofacial Surgery, n (%) | 100 (50%) | 100 (100%) | 0 (0%) | |
| Otolaryngology, n (%) | 65 (33%) | 0 (0%) | 65 (65%) | |
| Plastic and Reconstructive Surgery, n (%) | 35 (18%) | 0 (0%) | 35 (35%) | |
| **Treatment** | | | | .69 |
| ORIF, n (%) | 171 (86%) | 84 (84%) | 87 (87%) | |
| Closed treatment with MMF, n (%) | 29 (15%) | 16 (16%) | 13 (13%) | |
| **Type of Maxillomandibular Fixation** | | | | .0005 |
| Elastic MMF, n (%) | 98 (49%) | 49 (49%) | 49 (49%) | |
| Wire MMF, n (%) | 30 (15%) | 24 (24%) | 6 (6%) | |
| No MMF, n (%) | 72 (36%) | 27 (27%) | 45 (45%) | |

*Race/Ethnicity: "Other Race/Ethnicity" includes, but is not limited to, those who identified themselves as "American Indian/Alaska Native," "Native Hawaiian/Pacific Islander," "Asian," "Samoan," or "Vietnamese."
*MMF,* maxillomandibular fixation; *ORIF,* open reduction with internal fixation.

(95% CI −0.0075 to 0.0183; unadjusted $P = .41$). In the multivariate analysis, after adjusting for confounders, those who received nutrition counseling by an RD had an average percent weight change that was 0.0050 greater than that in patients who did not (95% CI −0.0085 to 0.0186; adjusted $P = .46$). In *t* test sensitivity analyses, not assuming equal variance, mean weight loss at the 2-week postoperative visit was not statistically different between the 2 groups (group 1: 2.36 lb [standard deviation (SD) 3.26 lb] and group 2: 1.77 lb [SD 3.79 lb]; $P = .24$). Similarly, in a *t* test sensitivity analysis, not assuming equal variance, percent weight change at 2 weeks was not found to be statistically different between the 2 groups (group 1: −2.86% [SD 4.04%], group 2: −2.19% [SD 4.53%]; $P = .28$). The results show no evidence of a significant association between nutrition counseling by an RD and percent weight change.

In the secondary univariate analysis (Table III), which looked at the association between nutrition counseling by an RD and postoperative complications, without adjusting for confounding variables (gender; age; preoperative body mass index; days to follow-up; medical comorbidity; tobacco, alcohol, and substance abuse; type of MMF; and race/ethnicity), the odds ratio of complications in those who had nutrition counseling by an RD was 0.250 (95% CI 0.068−0.926; unadjusted $P = .044$). In the multivariate analysis, after adjusting for confounding variables, the odds ratio of complications in those who had nutrition counseling by an RD was 0.124 (95% CI 0.017−0.894; adjusted $P = .038$). Those in group 1 had fewer postoperative complications (3% vs 11%;

**Table II.** Primary univariate analysis: study variables vs primary outcome: mean percent weight change at 2 weeks

| | Mean percent weight change at 2 weeks mean (SD) | Unadjusted P value (from ANOVA) |
|---|---|---|
| **Overall** | −2.54 (4.29) | |
| **Nutrition Counseling by RD** | | .28 |
| Yes | −2.86 (4.04) | |
| No | −2.19 (4.53) | |
| **Gender** | | .11 |
| Female | −3.79 (4.50) | |
| Male | −2.35 (4.24) | |
| **Race/Ethnicity** | | .59 |
| White | −2.75 (3.90) | |
| Black/African American | −1.78 (5.93) | |
| Mexican (American)/Chicano | −3.43 (4.14) | |
| Other race/Ethnicity | −2.22 (4.69) | |
| Missing race | −1.82 (2.24) | |
| **Comorbidity** | | .56 |
| Any comorbidity | −2.30 (5.03) | |
| No comorbidity | −2.67 (3.78) | |
| **Tobacco Use** | | .35 |
| Yes | −2.28 (5.11) | |
| No | −2.87 (4.52) | |
| **Alcohol Use** | | .59 |
| Heavy alcohol use | −2.13 (5.26) | |
| Moderate alcohol use | −2.91 (3.86) | |
| No alcohol consumption | −2.33 (4.31) | |
| **Substance Abuse** | | .35 |
| Yes | −2.09 (3.53) | |
| No | −2.75 (4.60) | |
| **Mechanism of Injury** | | .26 |
| Assault | −2.04 (4.53) | |
| Motor vehicle accident | −3.71 (4.80) | |
| Fall | −2.77 (2.71) | |
| Other | −3.08 (3.92) | |
| **Treatment** | | .50 |
| ORIF | −2.45 (4.46) | |
| Closed treatment with MMF | −3.04 (3.10) | |
| **Type of Maxillomandibular Fixation** | | .23 |
| Elastic MMF | −2.99 (3.31) | |
| Wire MMF | −2.75 (4.22) | |
| No MMF | −2.11 (5.02) | |

*ANOVA,* analysis of variance; *MMF,* maxillomandibular fixation; *ORIF,* open reduction with internal fixation; *RD,* registered dietitian; *SD,* standard deviation.

**Table III.** Secondary multivariate analysis: nutrition counseling status vs secondary outcome: complication (yes or no)*

| | Complication (yes) | Complication (no) | Adjusted P value |
|---|---|---|---|
| Nutrition counseling by an RD (n = 100) | 3 (1.5%) | 97 (48.5%) | .038 |
| No nutrition counseling by an RD (n = 100) | 11 (5.5%) | 89 (44.5%) | |

Overall complication rate 3% with RD vs 11% no RD.
*Adjustment for confounder variables: Gender, age, preoperative BMI, days to follow-up, medical comorbidity, tobacco, alcohol, and substance abuse, type of MMF, and race/ethnicity.*BMI,* body mass index; *MMF,* maxillomandibular fixation; *RD,* registered dietitian.

adjusted $P = .038$). When comparing the complication frequency to each of the study variables, we saw no significant difference between any of the study variables except for substance abuse status ($P = .04$).

## Survey results

Twenty-five patients (12.5%) completed the patient experience survey (Table IV) with 13 patients having received nutrition counseling by an RD. Group 1

**Table IV.** Ten-question patient experience survey results: perioperative nutrition counseling

| Survey question | Received nutrition counseling by RD (n = 13) | Did not receive nutrition counseling by RD (n = 12) | Unadjusted P value |
|---|---|---|---|
| I felt confident about following a diet that was appropriate, given my jaw fracture. | 4.69* | 3.22 | .0063 |
| I was satisfied with the nutrition advice I was provided during the management of my jaw fracture. | 4.69* | 3.56 | .0375 |
| I felt comfortable following the recommended diet. | 4.69* | 3.22 | .0063 |
| It was easy to follow the recommended diet. | 4.54* | 3.33 | .0222 |
| I felt that it was easy to get enough to eat. | 4.54* | 3.33 | .0222 |
| I knew how many times a day I should eat. | 4.38* | 2.67 | .0029 |
| I knew what kinds of foods to eat and/or drink. | 4.54* | 3.00 | .0033 |
| My weight changed after surgery to fix my jaw. | 4.69† | 3.78 | .0435 |
| I felt that I was able to eat a variety of foods. | 4.38* | 3.22 | .081 |

*1 = Strongly disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly agree.
†1 = Gained ≥10 lb; 2 = Gained <10 lb; 3 = My weight did not change; 4 = Lost <10 lb; 5 = Lost ≥10 lb.

reported greater weight change in response to question #9 compared with group 2 (mean response: 4.69 vs 3.78; $P = .0435$). Group 1 more strongly agreed with each of the 8 questions that utilized the Likert scale, where "1" represented "strongly disagree" and "5" represented "strongly agree." For example, group 1 more strongly agreed with the statements "I was satisfied with the nutrition advice I was provided during the management of my jaw fracture" (4.69 vs 3.56; $P = .0375$) and "I felt confident about following a diet that was appropriate given my jaw fracture" (4.69 vs 3.22; $P = .0063$).

## DISCUSSION

Research has demonstrated the importance of perioperative nutrition in patients undergoing surgery. This study investigated the role of nutrition counseling by RDs in the management of patients with isolated mandible fractures. We hypothesized that nutrition counseling by an RD would not affect postoperative weight change, would reduce the frequency of a postoperative complications, improve patient satisfaction, and increase the patient's ability to follow a recommended diet. We aimed to identify the role of nutrition counseling by an RD on the patient's postoperative course and conduct a survey regarding the nutrition counseling patients received during the management of their fracture.

The results of this study support our hypothesis that postoperative weight change was not different between those patients who received nutrition counseling by an RD and those who did not. This was observed by Worrall, who stated that "despite dietary advice and support, many patients continue to lose weight ... while their jaws are immobilized by [MMF] or they are eating a soft diet to protect their internal fixation plates."[6]

A nutritionally adequate diet in the perioperative period can shorten postoperative disability, reduce complications, and improve wound healing.[7] We hypothesized that nutrition counseling by an RD would contribute to an appropriate diet, given the patients fracture and treatment modality (e.g., soft food diet), and result in greater healing potential. As such, our hypothesis was that the frequency of postoperative complications would decrease among those who receive nutrition counseling by an RD. This was confirmed when looking at the complication rates, which were lower in group 1 (group 1 = 3%, group 2 = 11%; adjusted $P = .038$). However, it is unclear whether compliance with the recommended diet, intake of a nutritionally adequate diet, or other factors contributed to the lower frequency of complications. More studies need to be conducted to determine which nutrition-related factors contribute most to the risk of postoperative complications.

Overall, the incidence of any complication was 7% (14 of 200 patients). Among those who had a complication, all had been managed with ORIF. In a review of 472 patients with mandibular fractures, Serena-Gomez[21] reported a postoperative complication rate of 11.4%, which included infection, malunion, nonunion, and fixation plate exposure. In a review of 358 patients with 594 mandibular fractures treated in an urban teaching center, Lamphier[22] showed a complication rate of 13.3%, which included wound infection, wound dehiscence, nonunion, osteomyelitis, mobile teeth, facial nerve damage, and malocclusion. The complication rate in this study may be lower because of inclusion of patients who had received nutrition counseling by an RD.

In the United States, the Centers for Medicare and Medicaid Services will begin to adjust payments to certain Medicare providers on the basis of the quality of health care provided and patient satisfaction.[23] Given

this trend for health care reimbursement, patient satisfaction is more important than ever. Our hypothesis that perioperative nutrition counseling by an RD would improve patient satisfaction and increase the patient's ability to follow a recommended diet was supported by the results of the patient satisfaction survey. It is not surprising that RDs, given their ability to counsel others on food and nutrition, can provide superior nutritional counseling compared with the advice provided by other health care professionals. The survey data, although limited, suggest that it may be prudent to more strongly consider the role of RDs in the management of mandibular fractures.

We hope that our study findings add to the limited data on the role of perioperative nutrition in the management of isolated mandible fractures. The limitations of this study include differences in the use of MMF between the 2 groups, the low response rate for the patient experience survey, and our OMS service being the only craniofacial service that offered nutrition counseling by an RD. Although the type of MMF was adjusted for in the statistical analysis, it is unclear if weight change or the complication rate would be different if the use of MMF had been similar in both patient groups.

The low survey response rate (12.5% overall) was challenged by the length of time between the operative intervention and this study and by the patient population. Recollection is limited in those patients treated in the more distant past compared with those treated more recently. Irrespective of recall bias, the results suggest that patients who had nutrition counseling by an RD were more satisfied. Future prospective studies may be conducted to determine the impact of nutrition counseling by an RD on patient satisfaction.

In this cohort, nutrition counseling by an RD was provided only by the OMS service, and this may cause one to wonder if the complication rate was lower because of the treating service or by nutrition counseling by an RD. In a study by Dillon et al.,[24] which included patients presenting to the same institution for management of isolated mandible fractures, the complication rate among patients treated by the OMS service was 12.1%. Of those cases, 68.9% had complications that aligned with the definition of "complication" in this study. If, then, we assume that 68.9% of the patients who had any complication (12.1%) that was treated by the OMS service had one that was included in the definition of "complication" in this study, the complication rate may be closer to 8.3%. Therefore, if we compare the complication rates among those treated by the OMS service, we see a lower rate in the group that explicitly received nutrition counseling by an RD (8.3% vs 3% in this study). It is theoretical, but not unreasonable, to consider that in this study, the reduction in complication rates among those treated by the OMS service may have resulted from the nutrition counseling provided by an RD. Regardless, it is possible that some or all of the observed associations between the predictor and the outcome may actually have resulted from the association between the treating service and the outcome.

## CONCLUSIONS

Our results suggest that perioperative nutrition counseling by an RD in the management of isolated mandible fractures has no effect on weight change but is associated with decreased postoperative complications and increased patient satisfaction with the nutrition advice they receive. Given the increasing focus on patient satisfaction and implications for reimbursement, future studies are needed to confirm these results and further elucidate the role of RDs in the management of craniofacial trauma.

## DISCLOSURE

Dr. Dillon is the recipient of an Oral & Maxillofacial Surgery Foundation grant and an Osteoscience Foundation grant. Neither is a conflict of interest for this study.

## PRESENTATION

An oral abstract of this manuscript was presented at the 99th AAOMS Annual Meeting, October 9−14, at San Francisco, CA, USA.

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