



# DYSFUNCTION DICE

The D.O. Dice Game

## Abstract

A survey study of OMS-II student responses to a novel dice game to practice Osteopathic Manipulative Medicine was performed during a two hour lecture/practice session during their 4th semester of education. Survey results indicate positive response to the game and suggest the Dysfunction Dice game could be a useful tool in OMM education.

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## Summary

Dysfunction dice is an educational game designed to challenge Osteopathic medical students to utilize their knowledge of osteopathic manipulative medicine (OMM) and apply those skills in a quick and effective manner. The game has a basic set of rules (Appendix A) and two dice—one 8-sided die with the body regions labeled on each face, and a 6-sided die labeled with OMM treatment modalities. Players each take turns rolling the dice then proceed to diagnose and treat the assigned body region with the designated technique. Each performance is graded by the other students and points are allotted per the rules. The winner is determined on an endpoint decided before the game and can be a point total, time limit, round limit, etc. Designed to be flexible, this game and its rules can be catered to each player group as they see fit. It is not even necessary to keep score! The goal is to practice OMM skills and learn or review techniques. Advantages of this approach include cumulative and randomized demands, promoting peer-teaching opportunities, and offering an engaging, efficient method of review.

## Implementation & Data Collection

Designing and executing this project had three primary stages: 1) design/production, 2) play-testing with primary data collection, and 3) data analysis with future plan development. Initial designs were inspired by working with OMM residents/fellows and brainstorming the most important regions and techniques to include in the game. Once a basic design was conceptualized, the 3D models were created using TinkerCAD®, a free online 3D modeling program by Autodesk®. A number of iterations were designed and 3D printed with continuous improvements until a final, professional model was achieved. In addition to the 6-sided technique die used for this investigation, an 8-sided die with additional technique modalities was also developed for advanced practice. With the models finalized, dice were mass produced utilizing the 3D printer at the ATSU Memorial Library for use by the ATSU-KCOM OMS Year II Class. Play-testing was enacted during an OMM lab lecture in which the students were given the rules, sets of dice, and encouraged to play at intervals throughout the lecture resulting in over 30 minutes of total play time. At conclusion of the lecture, they were asked to respond to an anonymous 13-item survey designed to measure student engagement with the game and their perceptions of OMM. A total of 121 surveys were fully completed and included for analysis. The survey items (Appendix B) were based on a 5-point Likert scale and a final item allowed free-text responses for suggestions/comment. Data were then analyzed using CORR procedure and discussed with a statistician to determine significant findings.

### PROJECT TIMELINE

11/15/17	Sparktank Presentation
11/16/17-12/31/17	Design Refinement
1/1/18-3/14/18	Mass Production & Early Playtesting
3/15/18	Full scale playtesting with KCOM class of 2020
3/16/18-4/11/18	Data analysis & discussion w/ Statistician
4/12/18-8/31/18	Continued analysis & future planning

## Results & Discussion

Overall, Dysfunction Dice was positively received by students and verbal feedback from both students and faculty were likewise encouraging. Survey results (Figure 1) indicate the game to be “fun”, “engaging”, and clearly explained with the additional benefits of being challenging and useful for practice and review. Though most students responded that they would recommend the game to others and

indicated Dysfunction Dice could improve OMM education, responses were mixed when asked if they would play the game again to practice. One of the reasons cited was that students “ran out” of techniques to use because they only considered one technique for each combination. Instead of viewing High Velocity Low Amplitude treatment to the Thoracic spine as open-ended, students focused on using the “Kirkville Crunch” rather than learning or practicing a prone, seated, or standing technique—all of which are valuable treatments for various circumstances. This is a moderate setback, as Dysfunction Dice was designed to offer students opportunities for practice and learning they could use for years to come. As such, this is the primary point of focus for improvements in design for the future.

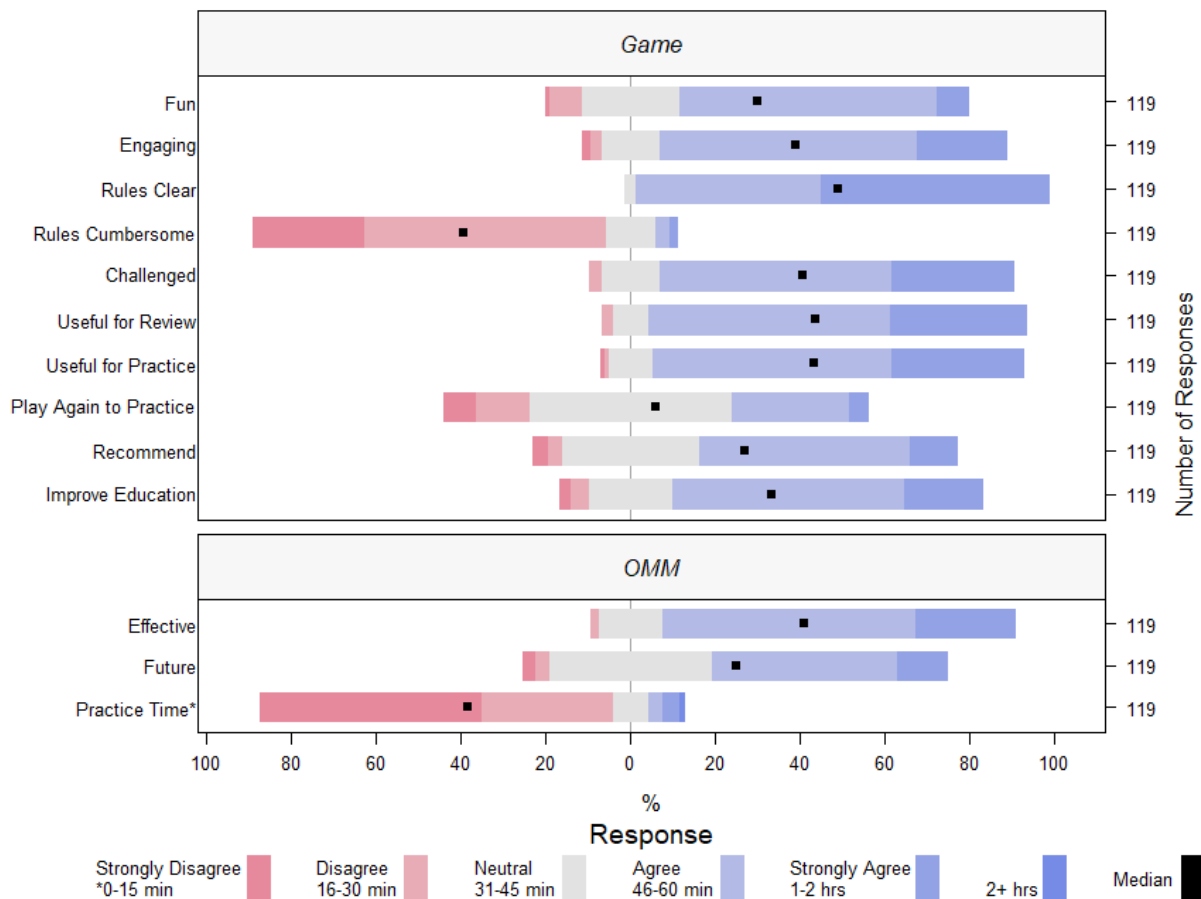


Figure 1: Box plot of survey responses by item

### Potential Future Applications & Development

Through the process of designing and executing this project, I have confidence in the promise Dysfunction Dice offers for the future of OMM education. First and foremost, the reception of the game was overwhelmingly positive, but indicates room for improvements in design that could drastically increase the game’s efficacy as a learning device. Since the most significant point of concern regarded the students’ desire to use the game again for practice, I have focused primarily on improvements to that aspect. Brainstorming this setback with OMM residents and fellows, I came to the idea that “Condition Cards” could be added to further increase the challenge level and encourage continued use. Condition


Cards are an add-on card deck with a disease state or patient position listed on each; a card would be drawn during each round of the game and students would have to utilize a treatment on the region appropriate for a patient with that condition or limitation. This would challenge the student to be aware of the contraindications of various techniques or perform a technique on a patient who is unable to assume various positioning. The addition of Condition Cards would increase the depth of knowledge required by the student and would prepare them to utilize OMM in their future practice of medicine. Though a beginning list of conditions has been compiled, this list continues to grow with the help of numerous individuals.

Future plans for this project are primarily focused on improvements to the game (e.g. Condition Cards), spreading awareness of this learning tool, and enabling access to as many students as possible. In order to spread awareness, development of a manuscript is underway with plans to submit to the Journal of the American Osteopathic Association. Additionally, I intend to provide access to all digital media required for this game including 3D models/designs, rules, and the list of Condition Cards free of charge to any student or educator who intends to use them for educational purposes. Furthermore, as a platform for this game develops, utilization of modern technology could serve to bolster student and educator access. Due to the game's simplicity, developing a mobile app is well within the realm of possibility and could be created with the right personnel and funding. Additionally, a simple instructional online video would be easy to create and distribute widely, which would not only promote ease of access, it would also cater to modern students' sensibilities and technological affinity. With these plans enacted appropriately, there is no telling how much of a positive impact this game could have on the future of OMM education.

### ***Acknowledgements***

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Appendix A: Dice Rules



## Dysfunction Dice

“The dice game for D.O.s”

This is a game for Osteopathic students and physicians to practice their OMT skills and preparedness. For 2-3 players.

1. During a round each player has a chance to be the operator, patient, and judge. The judge can be the patient if there are only 2 players
2. During their turn, the operator rolls the dice and attempts to diagnose and treat the body region with the type of technique determined by the dice roll (dice designations are listed on back)
3. The judge determines whether that technique was performed correctly and award points based on the ruling (point values listed on back)
4. After each player has their turn to be the operator, the round is over- if anyone has obtained over 11 points, they are declared the winner- if there is a tie, rounds continue until a winner or draw is decided (a different number of winning points can be determined before the game if 11 points is not enough/too much). You can also set a time limit or a round limit and determine the winner as whomever has the highest number of points at that time.

**Body Region Die: 8-sided**

- C: Cervical
- T: Thoracic
- L: Lumbar
- S: Sacrum
- P: Pelvis
- R: Ribs
- UE: Upper extremity
- LE: Lower extremity

**Technique Die: 6-sided**

- H: HVLA & Soft tissue
- A: Articular/LVMA
- CS: Counterstrain
- ME: Muscle energy
- B: Balanced Ligamentous Tension
- Bone: Whatever type of technique you want!

**Point values**

Treatment correct and successful	+2 points
Technique correct, but not well set up, localized, or activated	+1 point
Player needed to review technique in a manual and then performs it correctly	0 points
Incorrect treatment or rough patient handling	-1 point

Notes: Players should have reference material available (ie: Atlas of OMT).  
 -Awarding 2 vs 1 points should be based on if a point would be taken off on an OTM practical exam  
 -If a player would like to learn a new technique, it should be supervised by a physician.  
 -If a type of technique for the body region has not been taught in class, the dice can be rerolled or a new technique can be learned and performed for full points  
 -Dice can be used without using a point system if players simply want to practice

Designed & Created by Caleb Marting

## Appendix B: Survey questions

The questions for the usefulness and OMM perception survey were based on a 5 item Likert scale (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree) unless otherwise indicated. The questions are as follows.

## Usefulness questions- 5 point Likert

My partner and I utilized Dysfunction Dice to practice OMM: Yes/No

If Yes:

I found this game to be fun:

I found this game to be engaging:

The rules were clear/easy to understand:

The rules felt cumbersome while playing:

The game challenged my knowledge of OMM techniques:

The game was useful to review OMM:

This game was useful for practicing OMM:

I will use this game in the future to practice OMM:

I would recommend this game to other students:

I believe this game is a viable learning tool that will improve OMM education:

## OMM Perception questions (5 point Likert scale, unless indicated)

OMM is an effective treatment modality:

I intend to use OMM in my future career as a physician when it is indicated:

On average (excluding class time) do you practice OMM per week?

Options: 0-15 min, 16-30 min, 31-45 min, 45-60 min, 1-2 hours, 2+ hours

Additional comments were elicited with a blank space for students to free-write feedback.