

# **PRACTICAL CLINICAL COURSES**

A Service of the Gordon J. Christensen  
Career Development Program

## **V5165**

### **Customized Mouthguards for Any Sport**

Ray Padilla, DDS &  
Gordon J. Christensen, DDS, MSD, PhD

#### **Materials Included**

C.E. Instruction Sheet  
Products List  
Clinician Responsible  
Goals & Objectives  
Overview  
References  
AGD Post-Test

**Gordon J. Christensen**  
**PRACTICAL CLINICAL COURSES**

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Gordon J. Christensen

## PRACTICAL CLINICAL COURSES

*Sources of Products Discussed in*

### V5165 Customized Mouthguards for Any Sport

Presented by: Ray Padilla, DDS & Gordon J. Christensen, DDS, MSD, PhD

1. **Alginator II**  
Dux Dental  
600 East Hueneme Road  
Oxnard, CA 93033  
(800)833-8267  
(805)488-1122  
[www.duxdental.com](http://www.duxdental.com)
2. **Articulators**  
Whip Mix Corporation  
361 Farmington Avenue  
P.O. Box 17183  
Louisville, KY 40217  
(800)626-5651  
(502)637-1451  
[www.whipmix.com](http://www.whipmix.com)
3. **Biostar VI with Scan Technology**  
Great Lakes Orthodontics  
200 Cooper Avenue  
Tonawanda, NY 14150  
(800)828-7626  
(716)871-1161  
[www.greatlakesortho.com](http://www.greatlakesortho.com)
4. **Border Polishers**  
Dentsply Raintree Essix Glenroe  
7290 26<sup>th</sup> Court East  
Sarasota, FL 34243  
(800)883-8733  
(941)554-5250  
[www.essix.com](http://www.essix.com)
5. **Butane-Powered Microtorch**  
Dentsply Raintree Essix Glenroe  
7290 26<sup>th</sup> Court East  
Sarasota, FL 34243  
(800)883-8733  
(941)554-5250  
[www.essix.com](http://www.essix.com)
6. **COE Metal Impression Trays**  
GC America  
3737 West 127<sup>th</sup> Street  
Alsip, IL 60803  
(800)323-7063  
(708)597-0900  
[www.gcamerica.com](http://www.gcamerica.com)
7. **Disposable Impression Trays**  
Various Companies
8. **Dreve Vacfomat**  
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7290 26<sup>th</sup> Court East  
Sarasota, FL 34243  
(800)883-8733  
(941)554-5250  
[www.essix.com](http://www.essix.com)
9. **Drufomat Scan Pressure Machine**  
Dentsply Raintree Essix Glenroe  
7290 26<sup>th</sup> Court East  
Sarasota, FL 34243  
(800)883-8733  
(941)554-5250  
[www.essix.com](http://www.essix.com)
10. **Drufosoft Sports Mouthguard Material**  
Dentsply Raintree Essix Glenroe  
7290 26<sup>th</sup> Court East  
Sarasota, FL 34243  
(800)883-8733  
(941)554-5250  
[www.essix.com](http://www.essix.com)
11. **Erkoform-3d**  
Glidewell Laboratories  
4141 MacArthur Blvd.  
Newport Beach, CA 92660  
(800)854-7256  
(949)440-2600  
[www.glidewell dental.com](http://www.glidewell dental.com)
12. **Erkopress 300**  
Glidewell Laboratories  
4141 MacArthur Blvd.  
Newport Beach, CA 92660  
(800)854-7256  
(949)440-2600  
[www.glidewell dental.com](http://www.glidewell dental.com)
13. **Essix Vacuum Thermoforming Machine**  
Dentsply Raintree Essix Glenroe  
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Sarasota, FL 34243  
(800)883-8733  
(941)554-5250  
[www.essix.com](http://www.essix.com)
14. **Hydrogum 5**  
Zhermack Inc.  
P.O. Box 4195  
River Edge, NJ 07661-4195  
(877)819-6206  
(732)389-8540  
[www.zhermack.com](http://www.zhermack.com)
15. **imprESSIX Color Change Alginate**  
Dentsply Raintree Essix Glenroe  
7290 26<sup>th</sup> Court East  
Sarasota, FL 34243  
(800)883-8733  
(941)554-5250  
[www.essix.com](http://www.essix.com)

16. **Ivoclar Elastomer**  
Ivoclar Vivadent Inc.  
175 Pineview Drive  
Amherst, NY 14228  
(800)533-6825  
(716)691-0010  
[www.ivoclarvivadent.us.com](http://www.ivoclarvivadent.us.com)
17. **Jeltrate Plus**  
Dentsply Caulk  
38 West Clarke Avenue  
Milford, DE 19963  
(800)532-2855  
(302)422-4511  
[www.caulk.com](http://www.caulk.com)
18. **Model Glow (Model Soap)**  
Whip Mix Corporation  
361 Farmington Avenue  
P.O. Box 17183  
Louisville, KY 40217  
(800)626-5651  
(502)637-1451  
[www.whipmix.com](http://www.whipmix.com)
19. **Mounting Stone**  
Whip Mix Corporation  
361 Farmington Avenue  
P.O. Box 17183  
Louisville, KY 40217  
(800)626-5651  
(502)637-1451  
[www.whipmix.com](http://www.whipmix.com)
20. **Polishing Brushes**  
Dentsply Raintree Essix Glenroe  
7290 26<sup>th</sup> Court East  
Sarasota, FL 34243  
(800)883-8733  
(941)554-5250  
[www.essix.com](http://www.essix.com)
21. **Precision Electric Heat Knife**  
Dentsply Raintree Essix Glenroe  
7290 26<sup>th</sup> Court East  
Sarasota, FL 34243  
(800)883-8733  
(941)554-5250  
[www.essix.com](http://www.essix.com)
22. **Prima-Rock**  
Whip Mix Corporation  
361 Farmington Avenue  
P.O. Box 17183  
Louisville, KY 40217  
(800)626-5651  
(502)637-1451  
[www.whipmix.com](http://www.whipmix.com)
23. **Snap-Stone**  
Whip Mix Corporation  
361 Farmington Avenue  
P.O. Box 17183  
Louisville, KY 40217  
(800)626-5651  
(502)637-1451  
[www.whipmix.com](http://www.whipmix.com)
24. **Surfactant Debubbler**  
Almore International, Inc.  
P.O. Box 25214  
Portland, OR 97298  
(800)547-1511  
(503)643-6633  
[www.almore.com](http://www.almore.com)
25. **TriPhasix Alginate**  
Parkell, Inc.  
300 Executive Drive  
Edgewood, NY 11717  
(800)243-7446  
(631)249-1134  
[www.parkell.com](http://www.parkell.com)
26. **TurboMAX Alginate Auto Mixer**  
Dentsply Raintree Essix Glenroe  
7290 26<sup>th</sup> Court East  
Sarasota, FL 34243  
(800)883-8733  
(941)554-5250  
[www.essix.com](http://www.essix.com)
27. **Vacuum Power Mixer Plus & Combination Unit**  
Whip Mix Corporation  
361 Farmington Avenue  
P.O. Box 17183  
Louisville, KY 40217  
(800)626-5651  
(502)637-1451  
[www.whipmix.com](http://www.whipmix.com)

***Product names, the products themselves, and company names change rapidly. Please contact the companies shown to confirm current information.***

**Gordon J. Christensen Practical Clinical Courses, 3707 North Canyon Road, Suite 3D, Provo, UT 84604  
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## PROGRAM

### **V5165 Customized Mouthguards for Any Sport**

#### CLINICIANS RESPONSIBLE:

**Gordon J. Christensen, DDS, MSD, PhD**

CEO, Practical Clinical Courses

CEO, CR Foundation

Practicing Prosthodontist, Provo, Utah

**Ray Padilla, DDS**

Practicing Dentist, Manhattan Beach, CA

Member, Academy for Sports Dentistry

Team Dentist, Los Angeles Galaxy, Los Angeles Avengers, and UCLA Athletics

International Lecturer on Cosmetic Trauma Treatment and Injury Prevention

Lecturer, UCLA School of Dentistry - Dept of Advanced Education in General Dentistry

#### GOALS & OBJECTIVES

At the completion of this video presentation, participants should be able to accomplish the following:

1. Describe the frequency of sports-related accidents to the orofacial area.
2. Discuss the current use of mouthguards.
3. Describe the potential long-term costs of trauma to the orofacial area.
4. List the five current types of mouthguards.
5. List the disadvantages of stock mouthguards.
6. List the disadvantages of "boil and bite" mouthguards.
7. List the advantages of custom injection-molded mouthguards.
8. Compare the adequacy of vacuum- and pressure-made mouthguards.
9. List the advantages of pressure-formed mouthguards.
10. List the advantages of custom laminated pressure-formed mouthguards.
11. List 5 potential dental laboratories that provide mouthguards.
12. List three devices to make pressure-formed mouthguards.
13. Describe an adequate alginate impression for a mouthguard.
14. Discuss the type of stone most desirable to make a mouthguard.
15. Discuss the importance of proper border extensions on a mouthguard.
16. List the steps in making a custom laminated pressure-formed mouthguard.
17. Discuss how to place identification labels in laminated mouthguards.
18. Discuss how to place a strap attachment on a custom mouthguard.
19. Discuss laboratory fees for custom mouthguards.
20. Discuss clinical fees for custom mouthguards.

## OVERVIEW

### **V5165 Customized Mouthguards for Any Sport**

Millions of young athletes participate during their developmental years in sports that can cause considerable bodily damage, including orofacial accidents. Although mouthguards are used by many of these athletes, estimates are that 80% of the mouthguards do not provide adequate protection. The lifetime result of an unfortunate orofacial accident can be physiologically, psychologically, and financially devastating.

This video presentation overviews the various types of mouthguards, compares them, and shows how to make two very adequate types. The following and other subjects are included:

- Frequency of sports accidents related to the orofacial area
- Estimated current use of mouthguards
- Long-term results of orofacial trauma
- Types of mouthguards
- Stock mouthguards
- "Boil and bite" mouthguards
- Vacuum- and pressure-formed mouthguards
- Custom injected-molded mouthguards
- Making a custom injection-molded mouthguard
- Custom laminated pressure-formed mouthguards
- Comparative effectiveness of mouthguards
- Example laboratories for mouthguard fabrication
- Devices for in-office mouthguard fabrication
- Alginate impressions
- Stone casts
- Vestibular border extensions
- Trimming stone casts for mouthguards
- Lubricating the stone cast
- Ethylene vinyl acetate (EVA) options
- Scanning information into the device
- Heating EVA
- Placing pressure on the EVA
- Cooling the EVA
- Trimming the first layer
- Placing identification labels
- Placing the second layer of EVA
- Strap attachments
- Finishing and polishing the mouthguard
- Seating the mouthguard
- Different designs for custom laminated pressure-formed mouthguards
- Conclusion

## REFERENCES

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2. Padilla RR. A technique for fabricating modern athletic mouthguards. *Hawaii Dent J.* 2009;40(6):4, 6-12; quiz 17.
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6. Lee JW, Heo CK, Kim SJ, Kim GT, Lee DW. Mouthguard use in Korean Taekwondo athletes-awareness and attitude. *J Adv Prosthodont.* 2013 May;5(2):147-52. doi: 10.4047/jap.2013.5.2.147. Epub 2013 May 30.
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9. Mizuhashi F, Koide K, Takahashi M. Thickness and fit of mouthguards according to a vacuum-forming process. *Dent Traumatol.* 2013 Aug;29(4):307-12. doi: 10.1111/edt.12004. Epub 2012 Oct 22.
10. Tunc ES, Ozdemir TE, Arici S. Postfabrication thickness of single- and double-layered pressure-formed mouthguards. *Dent Traumatol.* 2013 Oct;29(5):378-82. doi: 10.1111/edt.12010. Epub 2012 Oct 16.
11. O'Malley M, Evans DS, Hewson A, Owens J. Mouthguard use and dental injury in sport: a questionnaire study of national school children in the west of Ireland. *J Ir Dent Assoc.* 2012 Aug-Sep;58(4):205-11.
12. Schildknecht S, Krastl G, Kühl S, Filippi A. Dental injury and its prevention in Swiss rugby. *Dent Traumatol.* 2012 Dec;28(6):465-9. doi: 10.1111/j.1600-9657.2012.01115.x. Epub 2012 Feb 2.
13. Duddy FA, Weissman J, Lee RA Sr, Paranjpe A, Johnson JD, Cohenca N. Influence of different types of mouthguards on strength and performance of collegiate athletes: a controlled-randomized trial. *Dent Traumatol.* 2012 Aug;28(4):263-7. doi: 10.1111/j.1600-9657.2011.01106.x. Epub 2012 Jan 25.

## POST-TEST

### **V5165 Customized Mouthguards for Any Sport**

1. One of the most adequate types of mouthguards is:
  - a. "boil and bite".
  - b. stock.
  - c. vacuum-formed.
  - d. custom laminated pressure-formed.
  
2. It has been estimated that \_\_\_\_\_ percent of mouthguards are adequate.
  - a. 20%
  - b. 40%
  - c. 60%
  - d. 80%
  
3. Most stock mouthguards have:
  - a. moderate retention.
  - b. optimum retention.
  - c. no retention.
  - d. slight retention.
  
4. Custom injected-molded mouthguards:
  - a. have only moderate retention.
  - b. occlude with the opposing arch.
  - c. are made in the dental office.
  - d. are not usually contoured to natural anatomy.
  
5. Custom laminated pressure-formed mouthguards:
  - a. can only be made in dental laboratories.
  - b. can only be made in the dental office.
  - c. fit very well.
  - d. cannot be related to specific sports.
  
6. Identification labels:
  - a. are placed between laminates for custom laminated pressure-formed mouthguards.
  - b. are relatively simple to place.
  - c. remain adequately visible during service.
  - d. all of the above.
  
7. Which is a wrong answer? Alginate impressions for mouthguards:
  - a. must include the mucobuccal fold.
  - b. must have optimum accuracy allowing intimate contact of the mouthguard with the soft and hard tissues.
  - c. are not adequate for mouthguards.
  - d. should be poured as soon as possible.

**POST-TEST (CONT'D)**

**V5165 Customized Mouthguards for Any Sport**

- 8. Custom laminated pressure-formed mouthguards:
  - a. can be one layer only.
  - b. can be two or more layers.
  - c. can have thick and thin sections.
  - d. all of the above.
  
- 9. About 80% of orofacial injuries involving teeth include primarily:
  - a. the 6 mandibular anterior teeth.
  - b. the 6 maxillary anterior teeth.
  - c. the 4 maxillary anterior teeth.
  - d. the 4 mandibular anterior teeth.
  
- 10. Which is an *incorrect* statement relative to mouthguard protection?
  - a. Stock mouthguards are inadequate.
  - b. "Boil and bite" mouthguards are adequate.
  - c. Custom laminated pressure-formed mouthguards are adequate.
  - d. Custom injection-molded mouthguards are adequate.

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