

## Introduction

Premature loss of teeth in the primary dentition can lead to space loss and malocclusion in the permanent dentition. To preserve typical eruption patterns, space maintainers can be used to minimize the problems caused by unilateral or bilateral teeth loss. The prefabricated band and loop space maintainer has become more popular, due to its convenience of being fit to the extraction space chair-side in one appointment. Its predecessor, the conventional band and loop, required laboratory fabrication and multiple appointments.

The purpose of this retrospective study was two-fold: 1) to demonstrate proportional changes in the usage of bilateral and unilateral space maintainers over a 20-year period and 2) to describe the specific types of space maintainers used during two different time periods. We hypothesize that the introduction of the prefabricated unilateral space maintainer changed the usage of space maintainers.

## Materials & Methods

- This retrospective study was conducted at the University of California, Los Angeles Pediatric Dental Clinic using data from two sources: the Orthodontics Appliance Book, used prior to 2012, and aXiUm electronic patient records used after 2011. Two groups were created for comparison of space maintainers prior to and following the introduction of the prefabricated band and loop: 2001 - 2005 (Group 1) and 2016 - 2020 (Group 2).

## Materials & Methods Cont.

- The prefabricated band and loop was introduced to the UCLA Pediatric Dental Clinic in 2014. Prior to this date, the only type of band and loop placed was lab fabricated (Group 1). In subsequent years (Group 2), the dental provider had the choice between a prefabricated or lab fabricated band and loop.
- Group 1 included 297 appliances and Group 2 included 497 appliances.
- The Orthodontic Appliance Book included hand-written appliance orders that were converted to a digital format and analyzed to determine the types of space maintainers used in Group 1.
- The aXiUm electronic records included billing codes and provider notes, which were analyzed to determine the types of space maintainers used in Group 2
- Records were reviewed to determine the specific type of space maintainer used irrespective of number of teeth lost. Appliance, billing code, and type of space maintainer were categorized.
- Each group was split into bilateral (lower lingual holding arch, Nance, transpalatal arch) and unilateral (band and loop, distal shoe) space maintainers based on billing codes (D1510 for unilateral fixed appliances, D1516 for bilateral fixed appliances) and compared.
- The data were evaluated based on the following:
  - Time period during which appliance was placed (Group 1 or Group 2)
  - Type of space maintainer placed (unilateral or bilateral)
  - Type of space maintainer predominantly used per group
- Chi-Squared Tests for Homogeneity and Contingency were conducted to analyze the data.

## Results

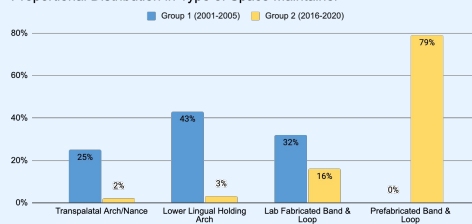
- A total of 297 appliances were included for analysis in Group 1. A total of 497 appliances were included for analysis in Group 2.

	Group 1		Group 2	
	n	Proportion	n	Proportion
Unilateral Appliances	94	32%	471	95%
Bilateral Appliances	203	68%	26	5%

**Table 1. A frequency table was created to represent the distribution of bilateral and unilateral appliances ordered in each Group.**

- A significant difference in the proportion of unilateral and bilateral appliances was demonstrated between Group 1 and Group 2 using a Chi-Squared Test for Homogeneity ( $p < 0.05$ ).
- The distribution of type of appliances ordered in Group 1: lab fabricated band and loop = 94 (32%), lower lingual holding arch = 129 (43%), Nance or TPA appliance = 74 (25%). The distribution of type of appliances ordered in Group 2: prefabricated band and loop = 393 (79%), lab fabricated band and loop = 78 (16%), lower lingual holding arch = 15 (3%), Nance or TPA appliance = 11 (2%).

**Proportional Distribution in Type of Space Maintainer**



**Figure 2. Appliance type distribution type in Group 1 and Group 2**

## Results Cont.

- A significant difference in the distribution of Space Maintainers used between Group 1 and Group 2 was demonstrated using the Chi-Squared Test for Contingency ( $p < 0.05$ ).

## Conclusions

- The results support the hypothesis that the introduction of prefabricated unilateral space maintainers changed the usage of space maintainers.
- There appears to be a shift in preference of bilateral space maintainers to unilateral appliances among the two groups over a 20-year period.
- There appears to be a predilection towards the use of prefabricated band and loop after their introduction.
- Further studies in more diverse populations will be important to determine the applicability of these results outside of the public university setting.

## References

- Space maintainers in the primary and mixed dentition - a clinical guide. E Watt, A Ahmad, R Adamji, A Katsimpali, P Ashley, J Noar
- Space maintainers in dentistry: past to present. Vikas Setia, Inder Kumar Pandit, Nikhil Srivastava, Neeraj Gugnani, Harveen Kaur Sekhon