

ABSTRACT

Research Objective: This study examined the impact of the introduction of dental therapists (DTs) on the capacity and production of the dental teams at Apple Tree Dental, MN.

Study Design: This study used 10 years of patient encounter data from 2009 (3 years before introduction of DTs in 2012) until 2019. Data analysis evaluated changes in the numbers and types of procedures, the relative value of procedures (RVUs), and fees (adjusted to 2018 fee levels) per dentist treatment day in each year.

Population Studied: During the study period, 15 DTs were employed by the organization along with more than 30 dentists and 30 dental hygienists. The main analytics were derived from the 2 dental centers with 10 years of patient encounter data.

Principle Findings: Results showed an increasing trend in the average number of procedures ($P<0.001$) and patient visits ($P=0.001$), particularly the proportion of children ($P=0.009$) per treatment day by a dentist after introduction of DTs. Dentists' production showed an increase in service intensity over the 7-year period after introduction of DTs from an average of 48.4 RVUs per treatment day in 2012-13 to 60.2 RVUs in 2018-19 ($P=0.010$). Similarly, average fees per treatment day increased from \$3,381 in 2012-13 to \$4,194 in 2018-19 ($P=0.048$).

Conclusions: The introduction of DTs to clinical teams enhanced capacity and productivity at Apple Tree Dental.

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INTRODUCTION

- Dental therapy is a new workforce model in which the clinician is trained to perform preventive and basic restorative dental services (positioned as a mid-level provider in dentistry)
- Interest exists in understanding how introduction of the dental therapy workforce to oral health care teams has impacted service mix, quantity and quality of care, and capacity of the delivery system
- Apple Tree Dental in Minnesota, a large non-profit community dental provider was among the first employers of dental therapists (DTs) in 2012
- Patients at Apple Tree Dental comprise all age groups, many of whom have special health care needs, and the vast majority of whom are low-income and Medicaid eligible
- This study examined patient encounter data from Apple Tree Dental to describe and compare the type and quantity of services provided by dentists *before* and *after* introduction of dental therapy to the practices

METHODS

- Data Source:** Encounter data that include more than a quarter of a million encounters for 76,342 patients obtaining care in 1 of the 7 dental centers operated by Apple Tree Dental
 - Variables:** Date of service, type of dental services provided, profession of clinical provider, and characteristics of patients
 - Study Period:** Services provided from February 9, 2009 (3 years prior to the first employment of a DT at the organization) through July 31, 2019
 - Dental Centers:** Coon Rapids (urban area) and Madelia (rural area) were selected because they had 10-year data and continuously employed a DT
- Study Outcomes:**
- Types of dental services performed by dentists *before* and *after* introduction of DTs at Apple Tree Dental in early 2012
 - Changes in intensity and distribution of services described in terms of Relative Value Units (RVUs):
 - RVUs represent sums of values attributed to various aspects of a dental procedure including the extent of professional training, complexity of the skills necessary, and costs of required resources
 - Economic impact of dental therapy practice on organizational revenue described by dental fees (adjusted to 2018 fee levels):
 - Dental fees represent the national average fees attributed to dental procedures (the American Dental Association develops fee schedules based on national surveys of dentists)

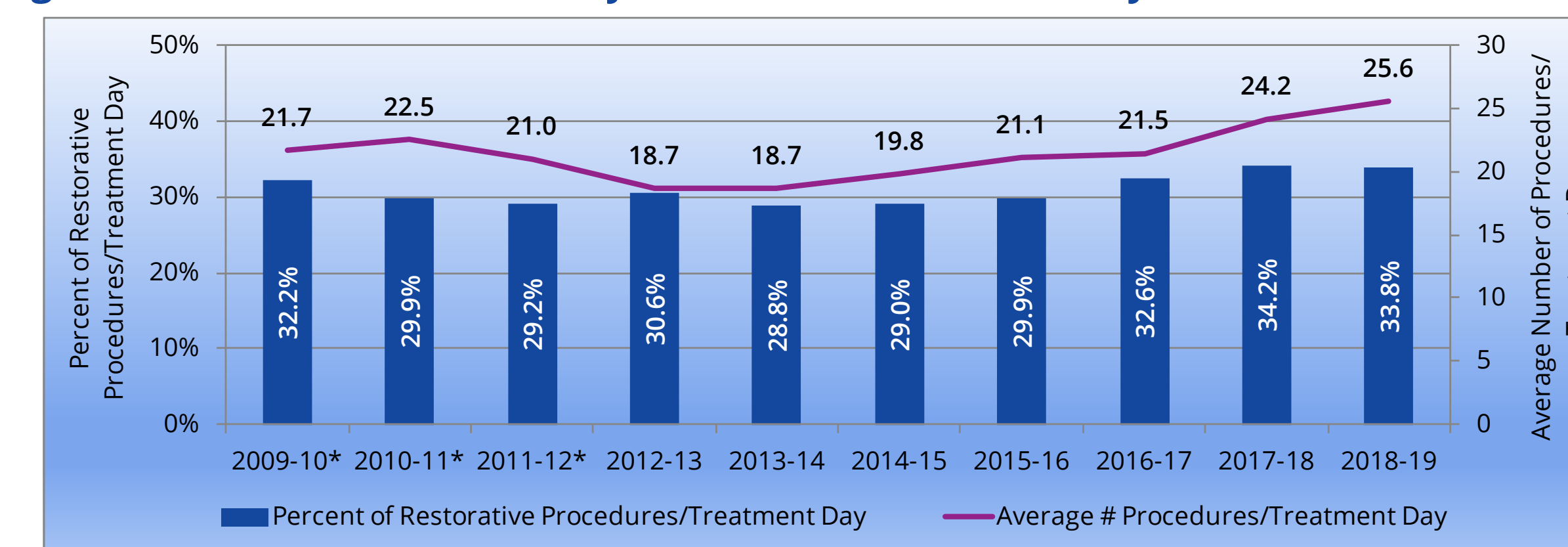
Statistical Analyses:

- Descriptive statistics (n, %, t-test, chi-square test) and trend estimates (linear regression) were used to compare services performed by dentists before and after introduction of DTs to the clinical team

RESULTS

- There was an increase in the average number of procedures per treatment day by a dentist *after* introduction of DTs (from 18.7 to 25.6; $P<.001$) as well as in the % of restorative services (from 30.6% to 33.8%; $P=.004$)

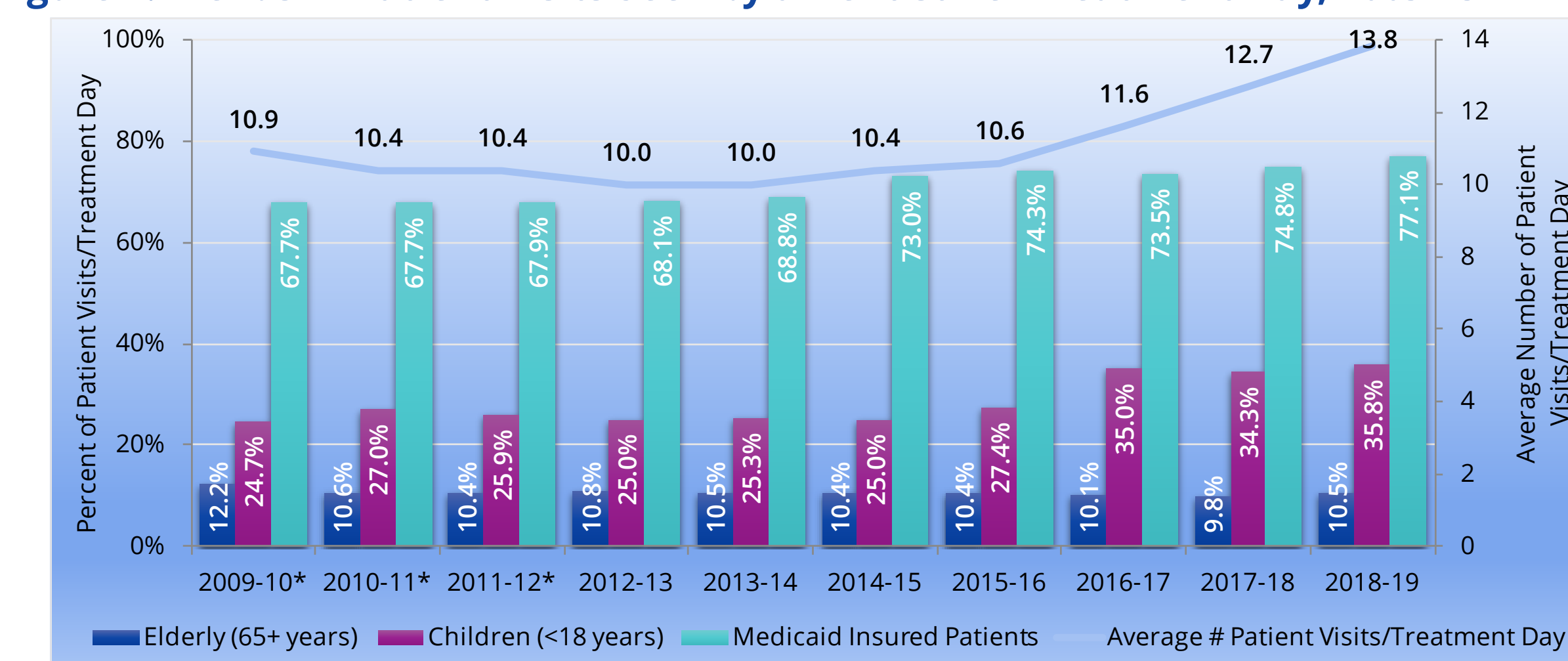
Figure 1. Trends in Procedures by Dentist Per Treatment Day, 2009-19



* Represents 3-year period preceding introduction of dental therapy.

- Both the average number of patient visits per treatment day ($P=.001$) and % of children patients ($P=.009$) seen by a dentist increased *after* introduction of DTs (% of Medicaid beneficiaries also increased [$P=.002$])

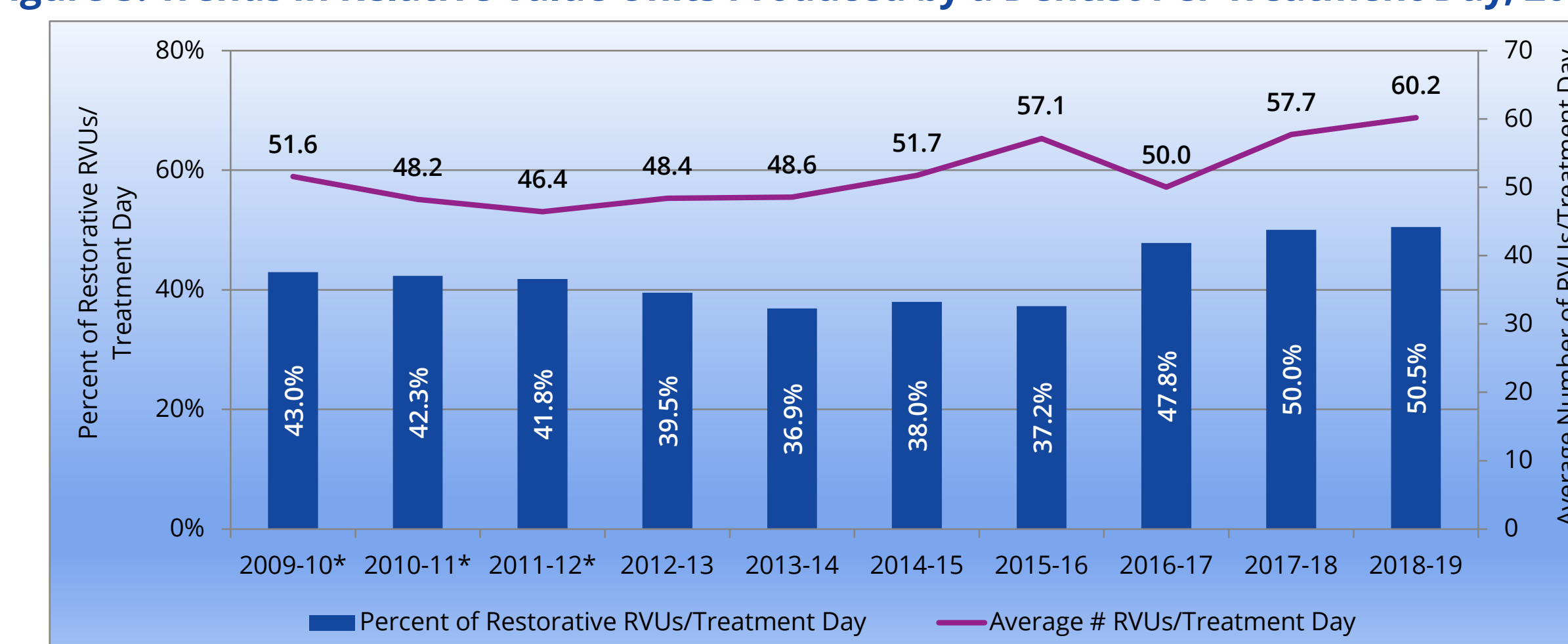
Figure 2. Trends in Patient Visits Seen by a Dentist Per Treatment Day, 2009-19



* Represents 3-year period preceding introduction of dental therapy.

- Dentists' production of RVUs per treatment day showed an increase in service intensity *after* introduction of DTs ($P=.010$). Restorative services generated the highest proportion of average RVUs per treatment day

Figure 3. Trends in Relative Value Units Produced by a Dentist Per Treatment Day, 2009-19

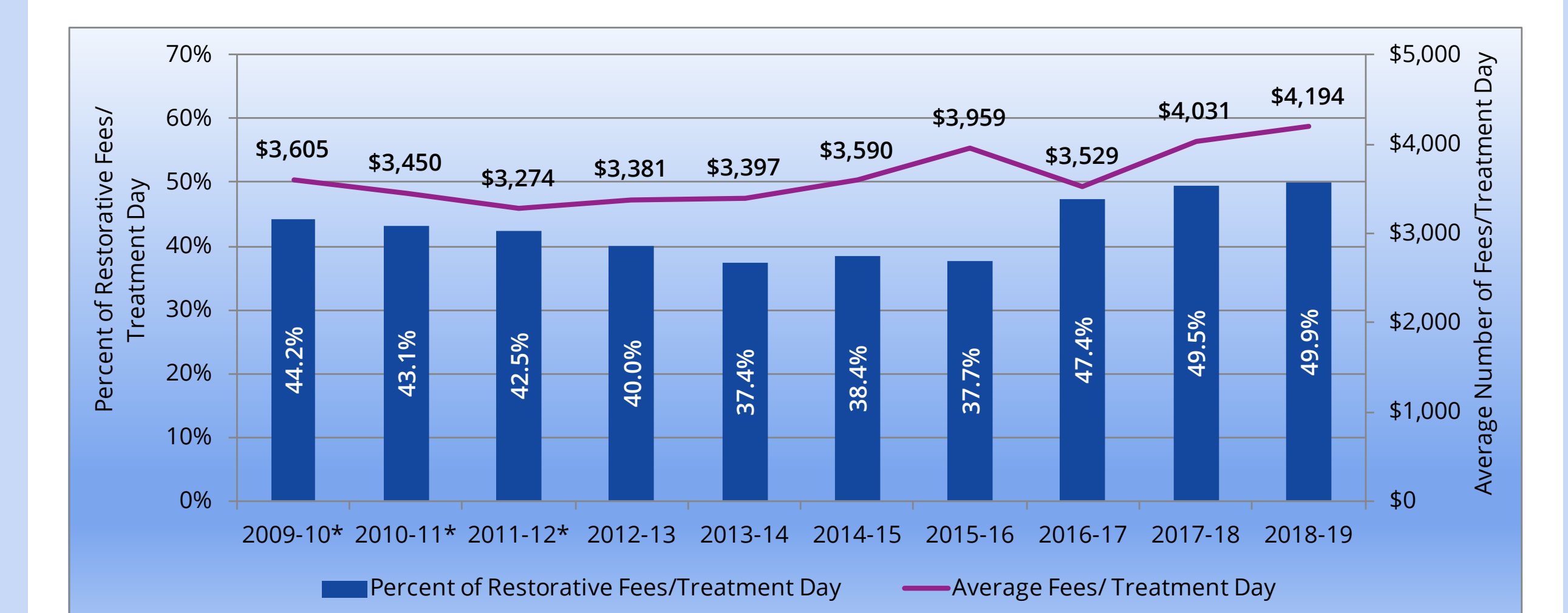


* Represents 3-year period preceding introduction of dental therapy.

RESULTS (con't)

- Average fees produced by a dentist per treatment day increased *after* introduction of DTs from \$3,381 in 2012-13 to \$4,194 in 2018-19 ($P=.010$)
- Almost 50% of fees generated by dentists in 2018-19 were from restorative procedures; there was a positive trend in the proportion of fees from restorative services provided by dentists between 2012 and 2019 ($P=.048$)

Figure 4. Trends in Schedule Fees by Dentist Per Treatment Day, 2009-19



* Represents 3-year period preceding introduction of dental therapy.

CONCLUSIONS

- Study findings suggest that both the number and complexity of procedures provided by dentists increased in the years subsequent to introduction of DTs to the centers' dental teams in early 2012, particularly *after* they were fully integrated
- In addition, the number of total patients as well as Medicaid beneficiaries increased concomitant with the introduction of dental therapy to the Apple Tree Dental reflecting organizational expansion
- The introduction of DTs to clinical teams enhanced capacity and productivity enabling Apple Tree Dental to meet increasing demand from the patient population, many of whom are low-income patients, Medicaid eligible, and/or have special health care needs

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