

Advancing Oral Health Across the Lifespan: A workshop

SESSION IV: Enhancing Oral Health Research and Innovation: A Window into the Future

Moderator: Michael Helgeson, DDS, Planning Committee Member

Speaker:

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Terri@Overjet.ai



Disclosure

Dr. Dolan is a full -time employee of Overjet



The Dental Care System is run on archaic infrastructure with siloed, unstructured data

Causing unnecessary administrative burden and hindering patient care.

Creating a system where all Americans have access to patient -
centric oral health care

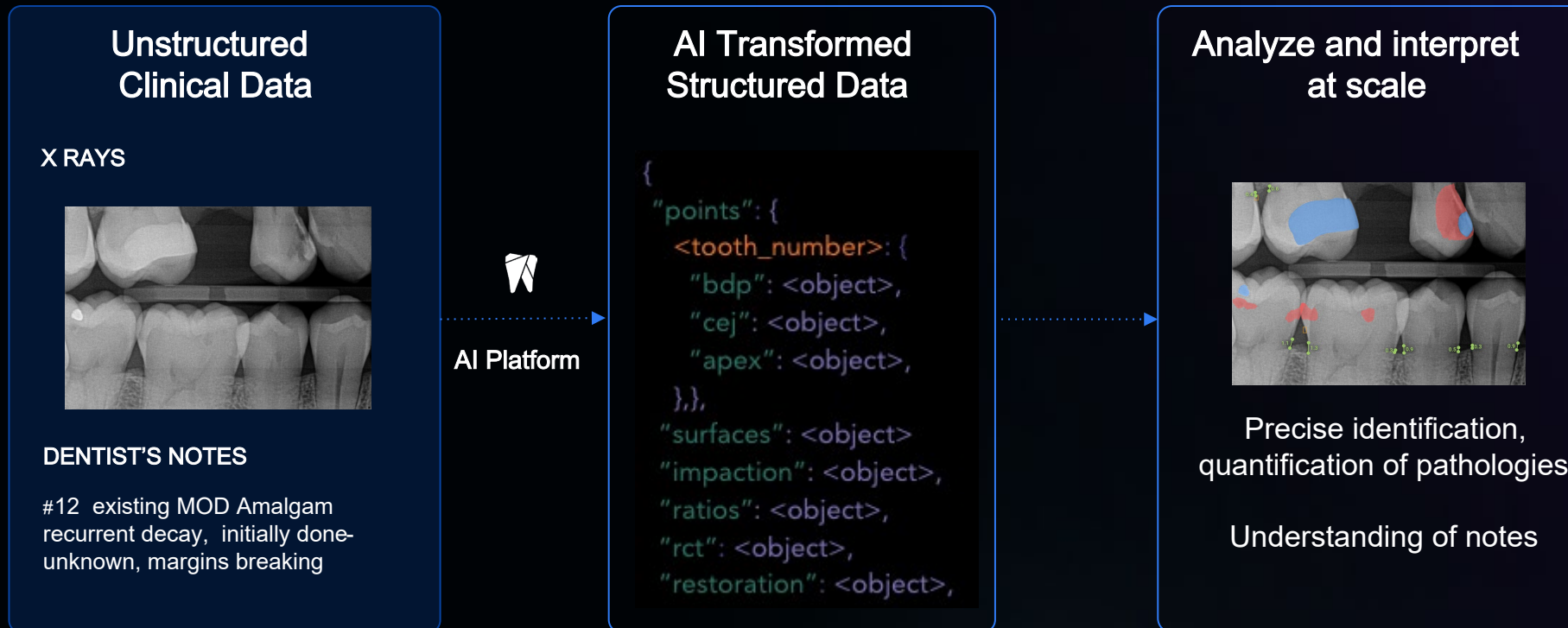
Requires us to... Re-imagine and re-engineer the dentalecosystem

Building AI-powered interoperable data
systems that automate administrative
workflows and augments evidence-
based clinical decision-making to
improve care/health.



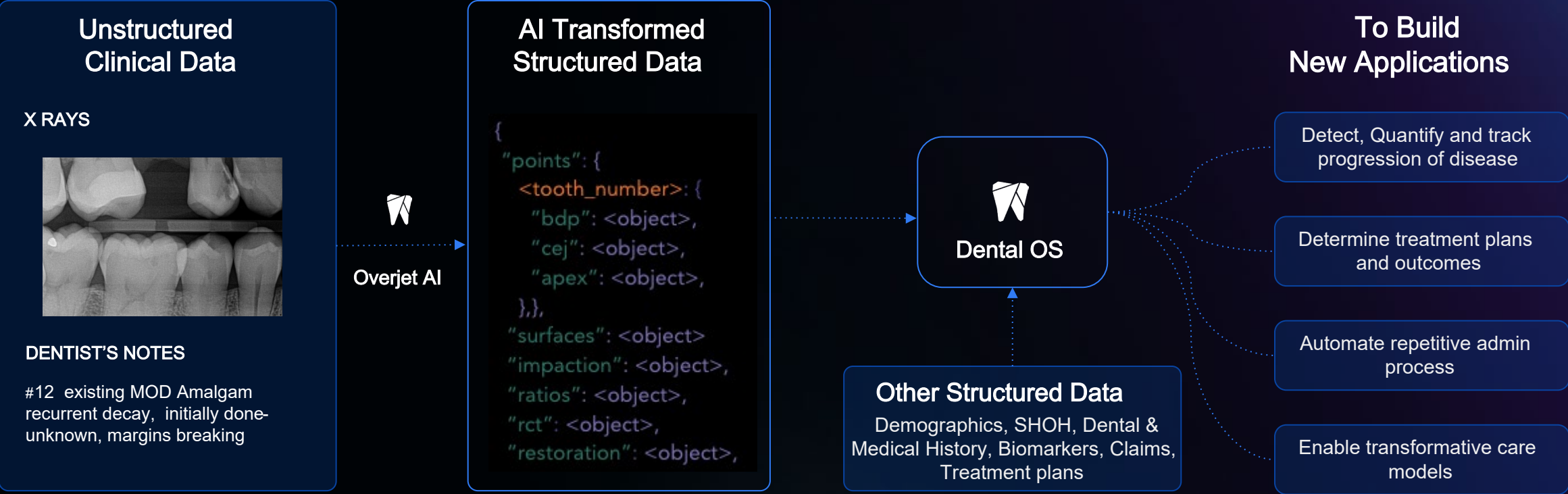
Using AI to Transform the Dental Ecosystem

Unlocking unstructured data to build AI -powered application to automate and augment workflows



Using AI to Transform the Dental Ecosystem

We unlock unstructured data to build AI -powered application to automate and augment workflows



For Payers

Problem: Claims are reviewed manually costing billions and resulting in only 60% inter-reviewer consistency.

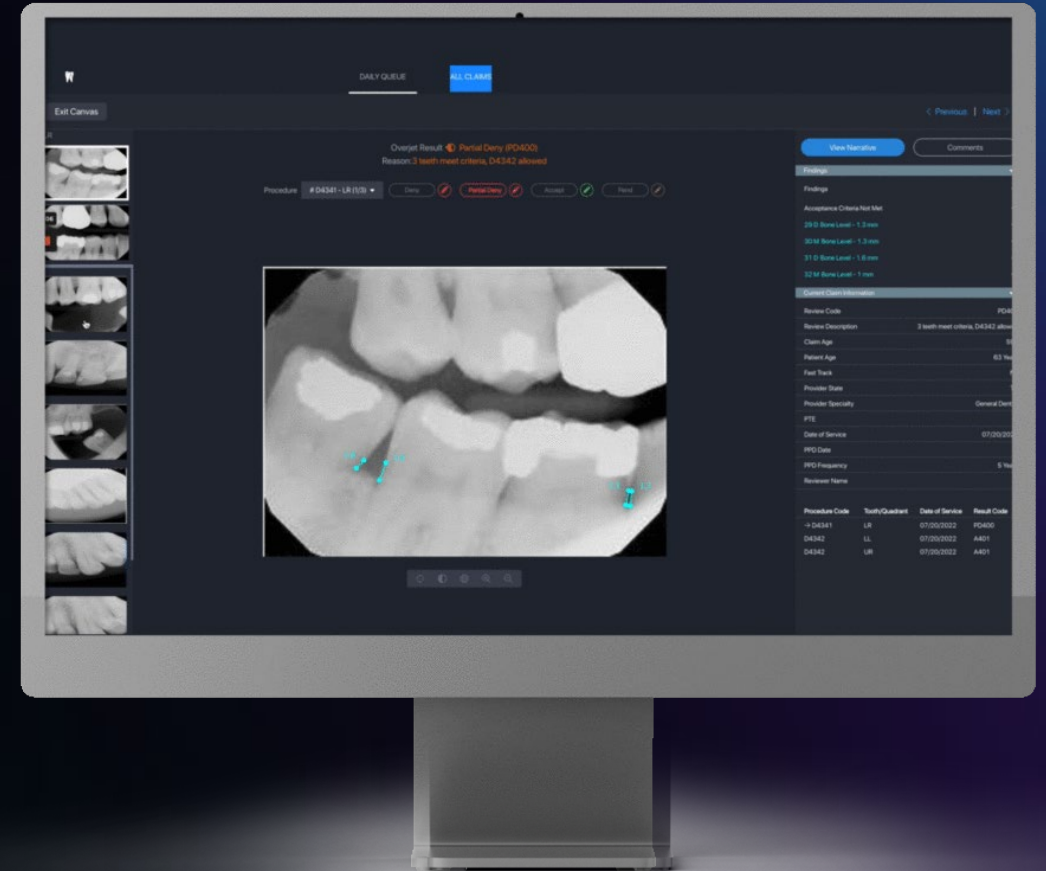
Solution: Automates claims approval with AI review and provides tooling to make clinical review faster and more consistent. Also offer consultants to supplement review.

5x

Faster Clinical Review

+50%

Increase in consistency



For Practices & Patients

Problem: Missed or late stage diagnosis and lack of patient acceptance (up to 50%) results in adverse patient outcomes.

Solution: Computer vision and clinical decision support servers as a co-pilot for clinicians that aids in diagnosis of pathologies, and the engagement and education of patients.

Solution: Engagement and empowerment of patients and caregivers to manage and maintain health



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PAYER OS



Claim
automation



Real-time
Claims



Provider
360



Member
360



More

PROVIDER OS



Co-pilot &
Insights



Imaging



RCM



Training



Patient
engagement

Multimodal, Multifunction PLATFORM

Computer Vision

LLMs

Data Analytics

Aligning evidence -based incentives of payers and practices is necessary for impact and improved access and outcomes



Framing Question:

What would it take to create a future where all Americans have access to oral health care?

- Use technology and AI to solve administrative problems for payers and providers
- Use AI to augment evidence-based clinical decision-making to improve care delivery and health outcomes
- **Create AI derived clinical outcome measures to assess impact**



Oral Health Status Index, 1983

A proposed index of oral health status:
a practical application

Marvin Marcus, DDS, MPH
Alma L. Koch, PhD, MPH
Jay A. Gershen, DDS, PhD

In recent years, socioeconomic indicators such as the Consumer Price Index have become nationally accepted as barometers of progress and change. The health care industry has been particularly needful of such an objective measure of effectiveness to assess the enormous and growing costs of providing health services. This type of cost-benefit analysis is essential for program planning and evaluation and to set priorities in disease-specific projects. This report discusses the development of an oral health status index for adult populations and presents an empirically derived oral health status index and its application to populations.

Background

Health status indicators

General health status measures have focused on identifying a common element of good or ill health through behavior. The Index of Well Being,^{1,2} for example, uses dimensions of social activity together with a symptom/problem complex that classifies any individual into one of 43 levels of being well. In a similar fashion, the Sickness Impact Profile³⁻⁵ characterizes individuals according to 13 categories of illness-related behaviors

Teeth

Bone loss
4-6mm 6+ mm

Tooth no.	Teeth	Bone loss 4-6mm 6+ mm
1	M R D N C	
2	M R D N C	
3	M R D N C	
4	M R D N C	✓
5	M R D N C	✓
6	M R D N C	
7	M R D N C	✓
8	M R D N C	✓
9	M R D N C	✓
10	M R D N C	✓
11	M R D N C	✓
12	M R D N C	✓
13	M R D N C	✓
14	M R D N C	✓
15	M R D N C	✓
16	M R D N C	✓
17	M R D N C	✓
18	M R D N C	✓
19	M R D N C	✓
20	M R D N C	✓
21	M R D N C	✓
22	M R D N C	✓
23	M R D N C	✓
24	M R D N C	✓
25	M R D N C	✓
26	M R D N C	✓
27	M R D N C	✓
28	M R D N C	✓
29	M R D N C	✓
30	M R D N C	✓
31	M R D N C	✓
32	M R D N C	✓

No.	Coeff	Subtotal
MAXIMUM		100.00
Missing	5	-3.13
Free ends	1	-3.13
Replaced	0	+0.61
Decayed	11	-1.79
4-6 mm	15	-0.73
6+ mm	6	-3.02
INDEX		32.46

LEGEND
M = missing
R = replaced
D = decayed
N = normal
C = space closure
FE = free end

JADA, Vol. 107, November 1983 ■ 729

Overjet's AI - enabled OS- B, 2024

Development and Validation of an AI-Enabled Composite Oral Score Using Large-Scale Dental Data

Sri Kalyan Yarlagadda^{1,*}, Navid Samavati^{1,^}, Mina Ghorbanifarajzadeh^{1,*}, Vlada Levinta^{1,*}, Alireza Sojoudi^{1,^}, Wardah Inam^{1,^}, and Teresa A. Dolan^{1,^,*}

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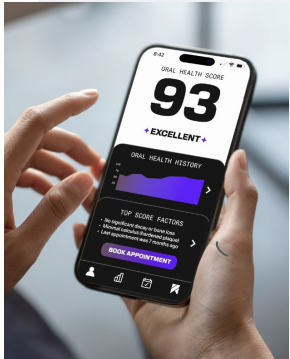
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^these authors have jointly supervised this work

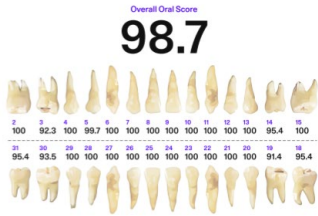
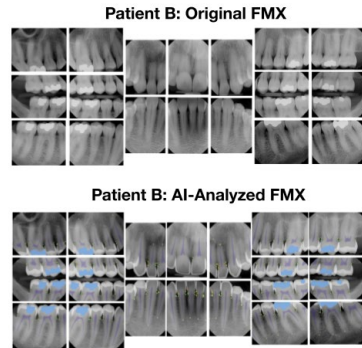
ABSTRACT

This research introduces Oral Score Basic (OS-B), a novel Artificial Intelligence (AI) derived methodology designed to provide a comprehensive, objective assessment of individual teeth and overall oral health. Leveraging data from more than 340,000 patients across 2,558 U.S. dental practices, OS-B combines radiographic findings and periodontal probing depths with a treatment probability-weighted cost function to quantify the severity of dental conditions. The OS-B score aims to address limitations in prior oral health scoring systems by incorporating nuanced clinical data, accounting for disease severity, and providing a scalable, data-driven approach to measuring oral health. This score was developed using Overjet's FDA-cleared AI platform, which detects dental conditions using bitewing and periapical radiographs, providing a detailed analysis of each tooth. OS-B's effectiveness was validated by demonstrating a strong correlation between tooth scores and treatment costs, surpassing the predictive power of previous scoring systems. This research presents a foundational framework for AI-enabled oral health scoring, with potential applications in value-based care, population risk analysis, and consumer health management. Future iterations may expand to include additional dimensions of oral health beyond clinical conditions such as risk factors and measures of oral function and esthetics, further enhancing the score's clinical utility and patient engagement.



Introduction

Oral health is a critical component of overall health and well-being yet quantifying it comprehensively has remained a challenge. Over the past five decades, numerous oral health status indices have been developed to measure oral health status and to measure the impact of healthcare interventions. Nikkias et al. [1, 2], the Index of Oral Health Status by Markus et al. [3], and Wilson [4] that was later modified and developed by Denplan (Winch Score [5]. More recently, commercial products such as Previser have emerged [6]. While these previous efforts have been valuable, they often rely on binary disease classifications, failing to capture the nuanced advent of artificial intelligence (AI) and advanced computer vision techniques presents an unprecedented opportunity to revolutionize oral health assessment.



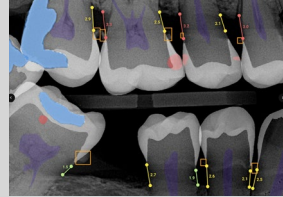
AI Generated Oral Score

AI-enabled, evidence-based, person-centered measure of the oral health of a person or population

Dental Practice Data

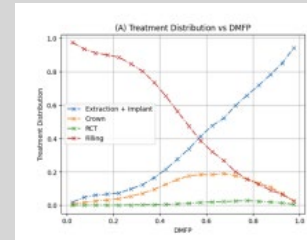
- 2,558 dental practices
- 321,530
- 524,298 teeth
- Geographically dispersed across the US

AI Analysis



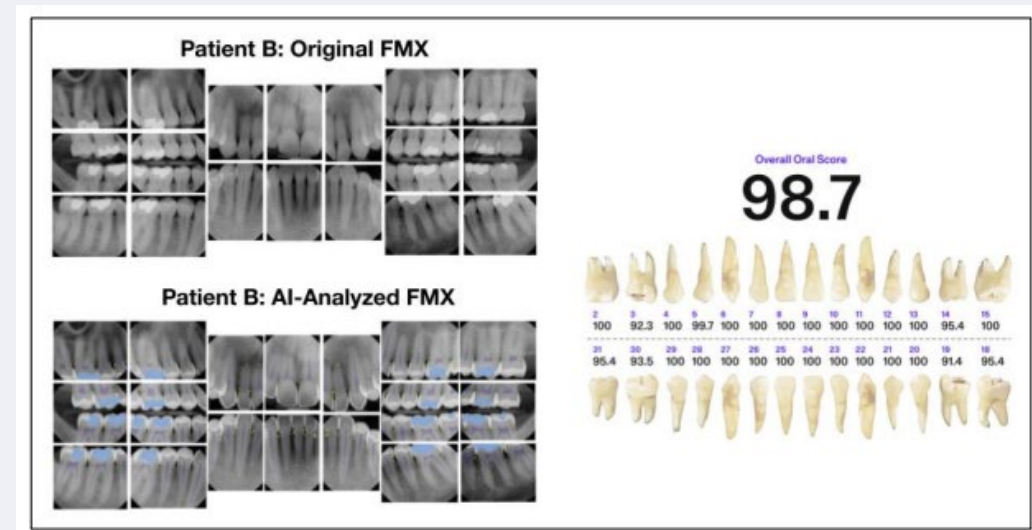
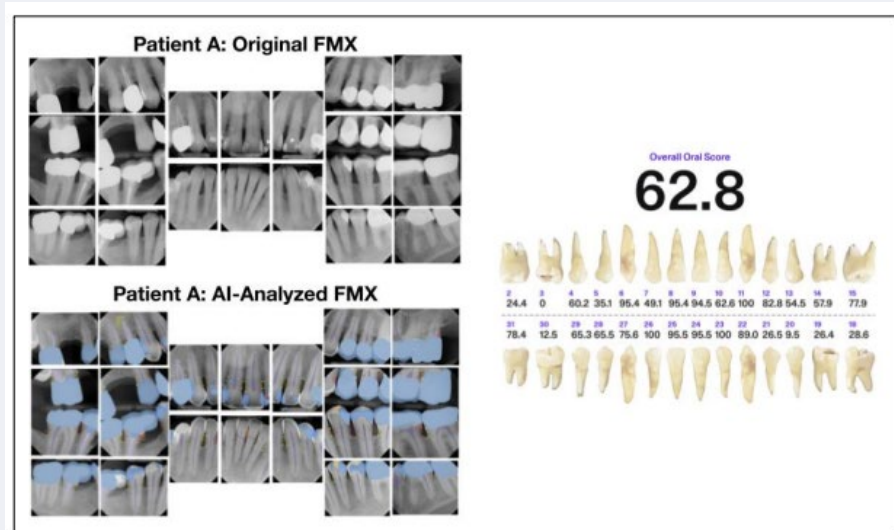
8 clinical indicators from X-rays + PMS data (perio, treatment codes)

“treatment probability weighted cost-function” to determine weights and tooth scores



Oral Score

Average of tooth scores for 28 teeth

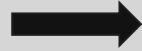


AI Generated Oral Health Score

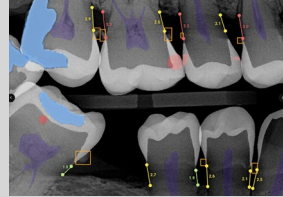
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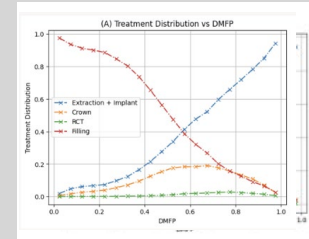
AI Analysis



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Oral Score

Average of tooth scores for 28 teeth

How can the Oral Score be used?

Consumers

Clinical Practice

Military

Research

Policy

Insurance



Outcomes-based quality monitoring and improvement

Deployment readiness

Academic and other collaborations to advance oral epidemiology, health outcomes research, and influence health policy

Plan design; outcome scoring for VBC; resource allocation based on risk and disease levels; predict future disease/costs; provider focused or “off review” programs

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