

Dentistry 2035

Advancing Oral Health Throughout the Lifespan

Will you be:
the Disruptor or the Disrupted?

What will healthcare/dentistry
look like in 10-15 years?

What would revolutionize your worlds?

Will you survive or thrive?

J Oxman | Retired Corporate Scientist, 3M Oral Care
November 19, 2024



Many thanks

*The National
Academies of*

SCIENCES
ENGINEERING
MEDICINE

Dr. Mike Helgeson

Innovation Culture

Curiosity

Customers

Contemplation

Collaboration

Creation

Commercialization

Clinical Success!

Shifting Paradigms for Advancing Oral Health Across the Lifespan

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MEDICINE

Innovative Technical Solutions

What if?



Opportunity

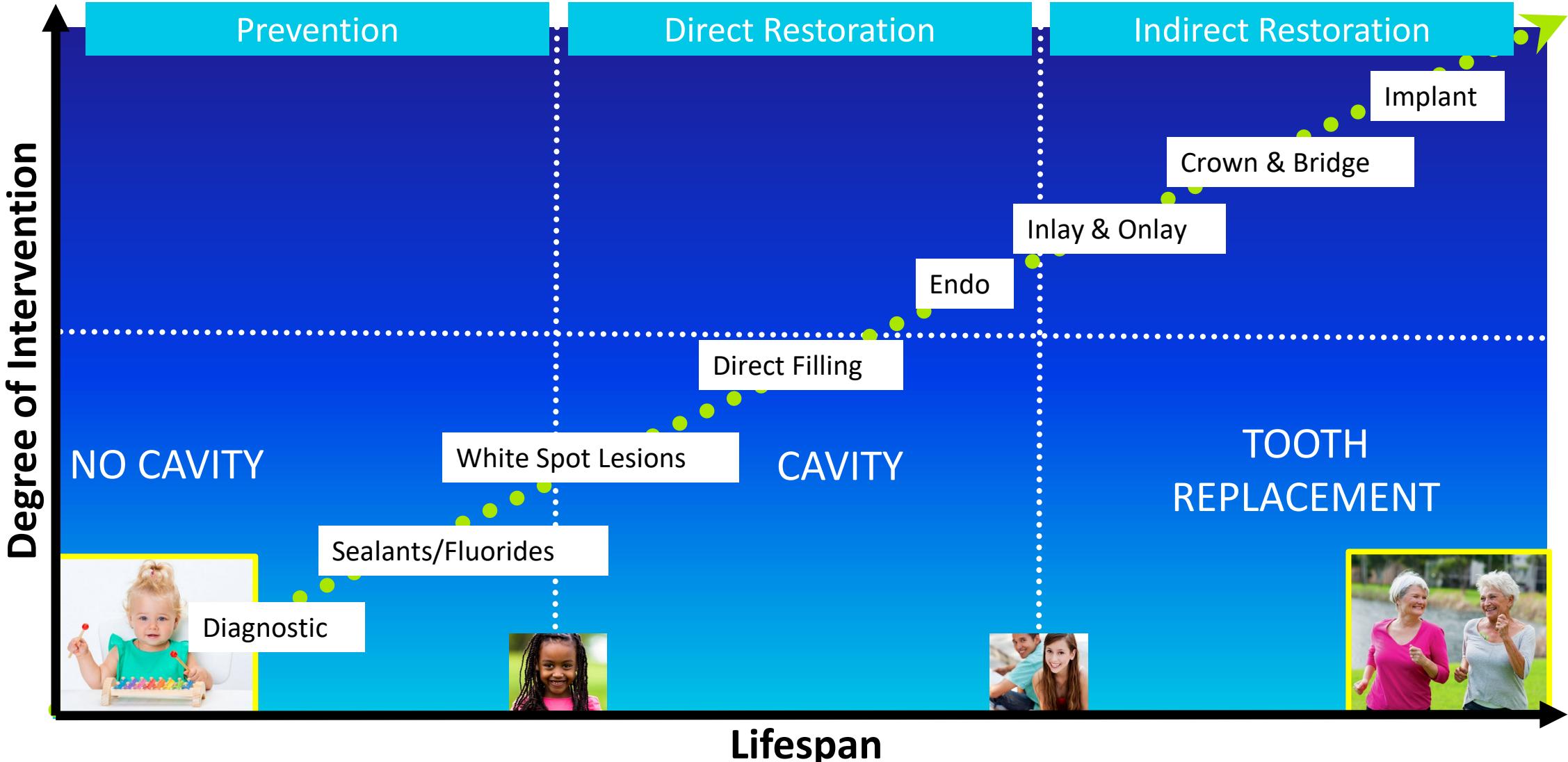
What's possible?



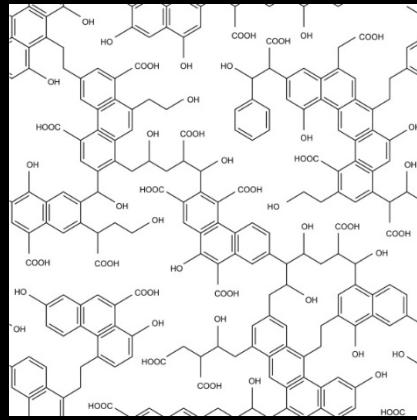
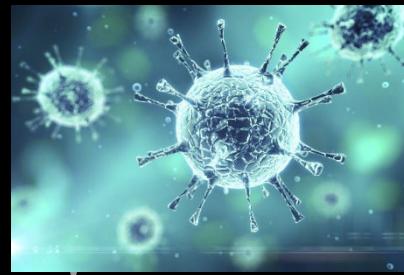
Solution

Where is oral care headed?....pediatric to geriatric

Trained to be a tooth surgeon... What would you wish for your loved ones?



Disruptive Oral Care Markets and Technologies of the Future



Ab Abrasives												
Ad Adhesives	Em Electronic Materials											
Bi Biomaterials	Fi Films	Nw Nonwovens										
Ce Ceramics	Fl Fluoromaterials	Pm Performance Materials	Am Additive Manufacturing	Pc Precision Coating & Web Processing	Rp Radiation Processing	An Analytical Science	Pr Process Design & Control	Cv Computer Vision	Ro Advanced Robotics	Bd Biodefense & Microbial Management	Eg Engineered Graphics	Mf Mechanical Fasteners
Co Advanced Composites	Mm Metamaterials	Po Porous Materials & Membranes	Mo Molding	Pd Particle & Dispersion Processing	Su Surface Modification	Cp Converting & Packaging	Sd Sustainable Design	Ds Data Science & Analytics	Se Sensors	Cs Connected Systems	Fe Flexible Electronics	Sw Skin & Wound Management
Do Dental & Orthodontic Materials	Nt Nanotechnology	Rm Release Materials	Mr Micro-replication	Pp Polymer Processing	Tf Thin Film & Plasma Processing	In Inspection & Measurement	We Accelerated Weathering	Es Electronic Systems	Ss Software Solutions	Dd Drug Delivery	Fp Filtration & Purification	Tm Thermal Management



Anticipate and Create the Future...

Markets and Technology

Dare To Look at the World a Different Way!

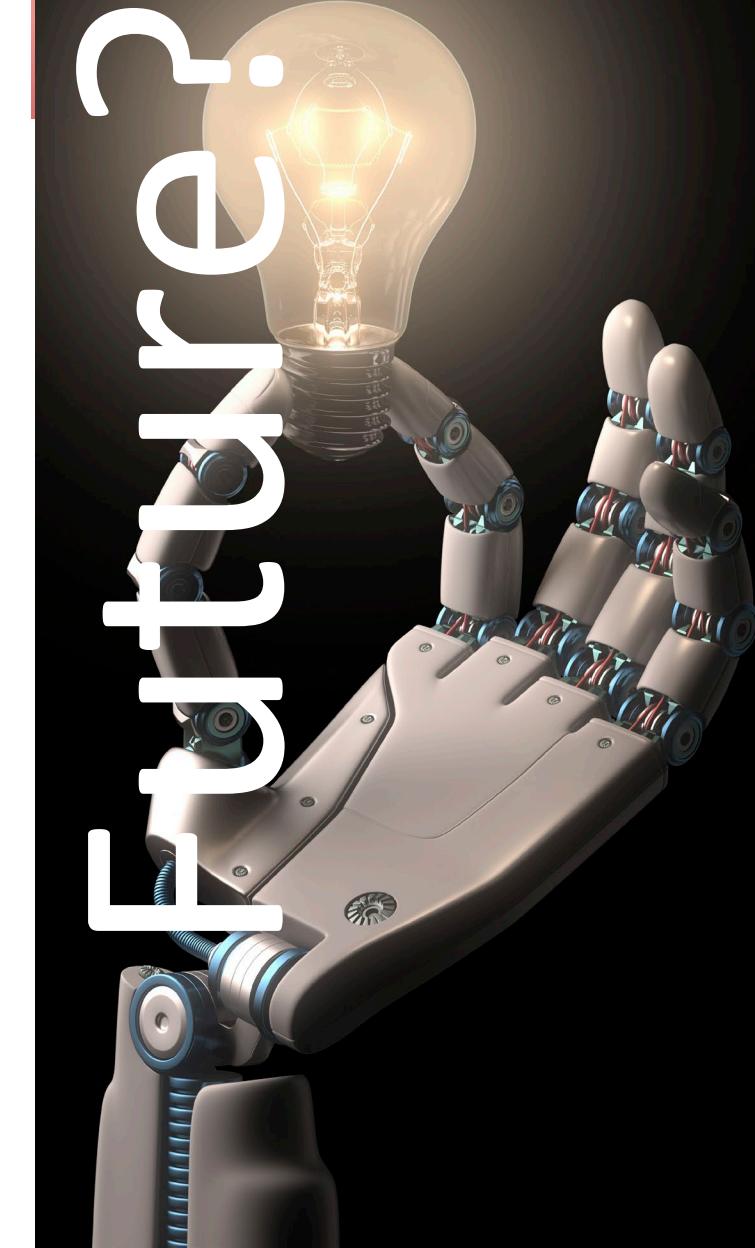
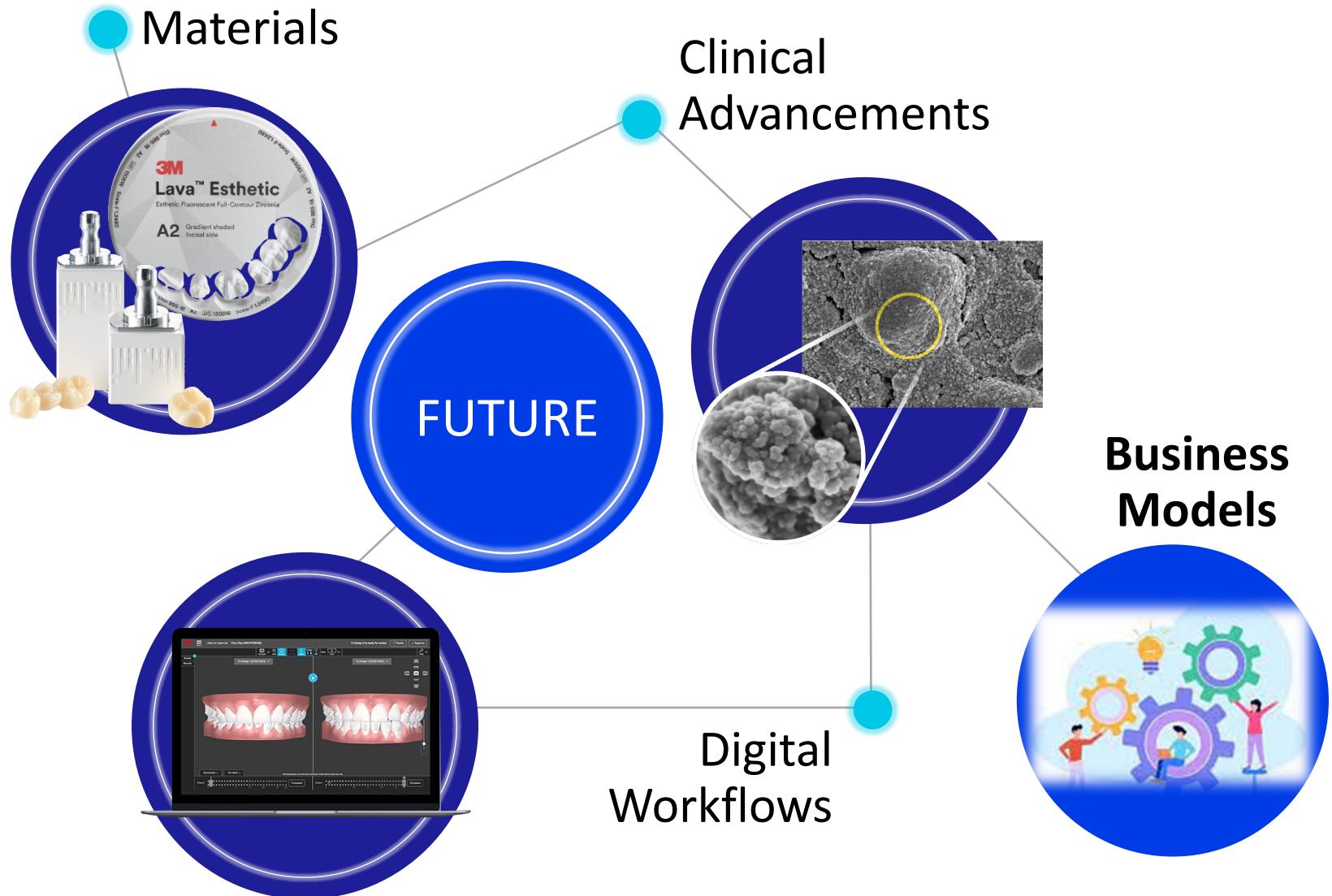


7/28/2011



Could this be
you?

What if's of tomorrow

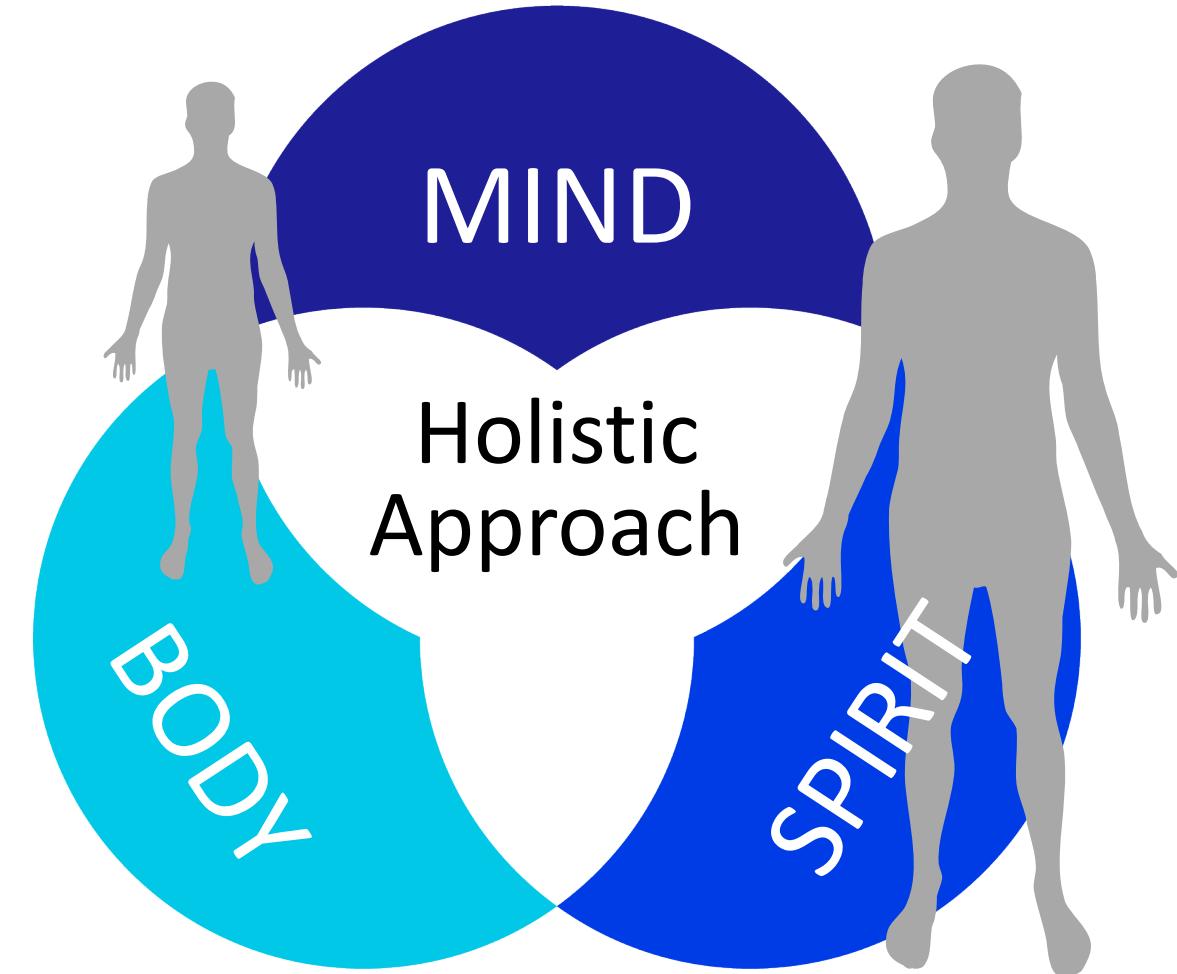


What if “Drill, Fill and Bill” Disappears?

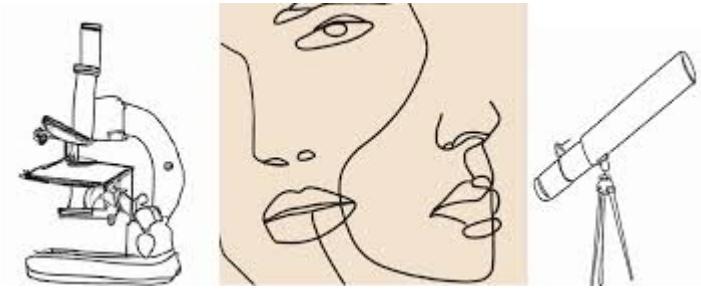


Will we have a
Plan “B”?

Tomorrow:
“DDH” Dr. of Dental Health



Several Global Megatrends... Forces that May Impact Dentistry



Healthcare Mega-Trends

1

Personalization

2

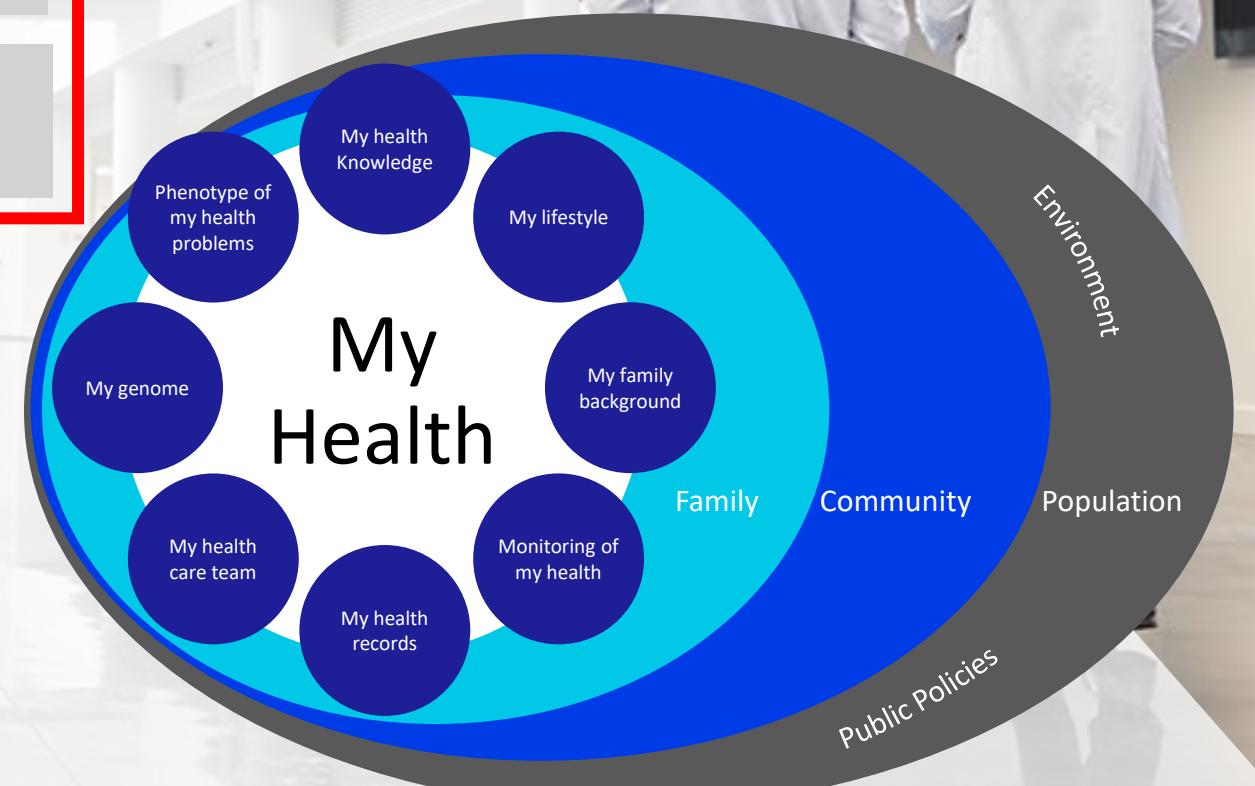
Business Model Disruption

3

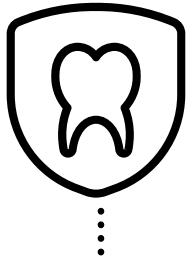
Consolidation

Healthcare Provider Consolidation

In order to provide higher quality care at lower costs, hospitals are being acquired by major healthcare organizations and physicians are joining these larger organizations.



ADA Health Policy Institute: Inaugural Dental Industry Report (2019).....*Key Trends*

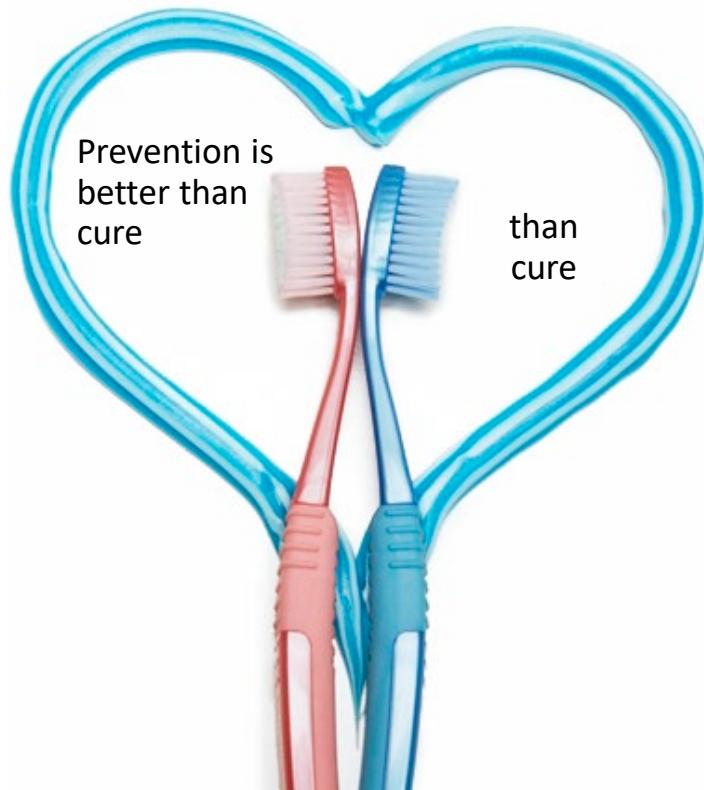


**Solo dental practices
declined:**

83%
to 78%
(last 10 yrs)

**Group practices
increased**

Shifts in
Preventive and **diagnostic**
dental procedures



Patient landscape
becoming more
consumer driven

More \$\$\$ conscious
and
Emphasizes convenience

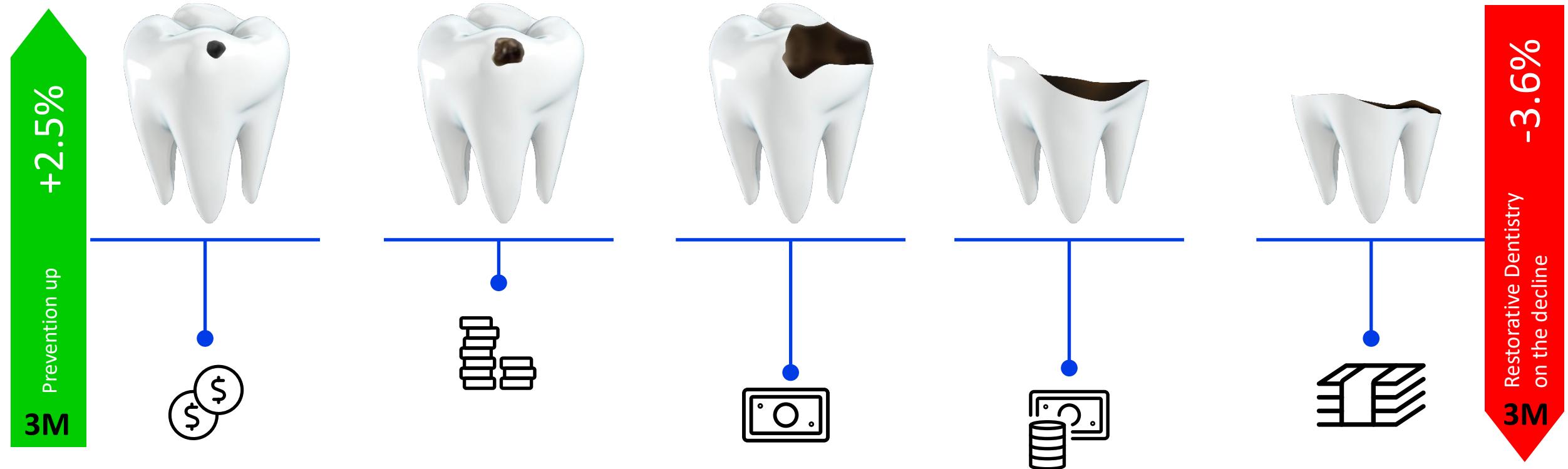
 **minute
clinic®**

You can

PAY NOW

Or you can

PAY LATER!



Value-based preventive healthcare is coming!

Value Over Price is Winning!

- Faster, easier, good enough products & services
- Digitization, Big Data, Analytics, AI, will drive:
Procedural predictivity, precision, efficiency!
- Rapid growth of **DSO's and HMO's**
- BOTH the medical and dental **data** within?



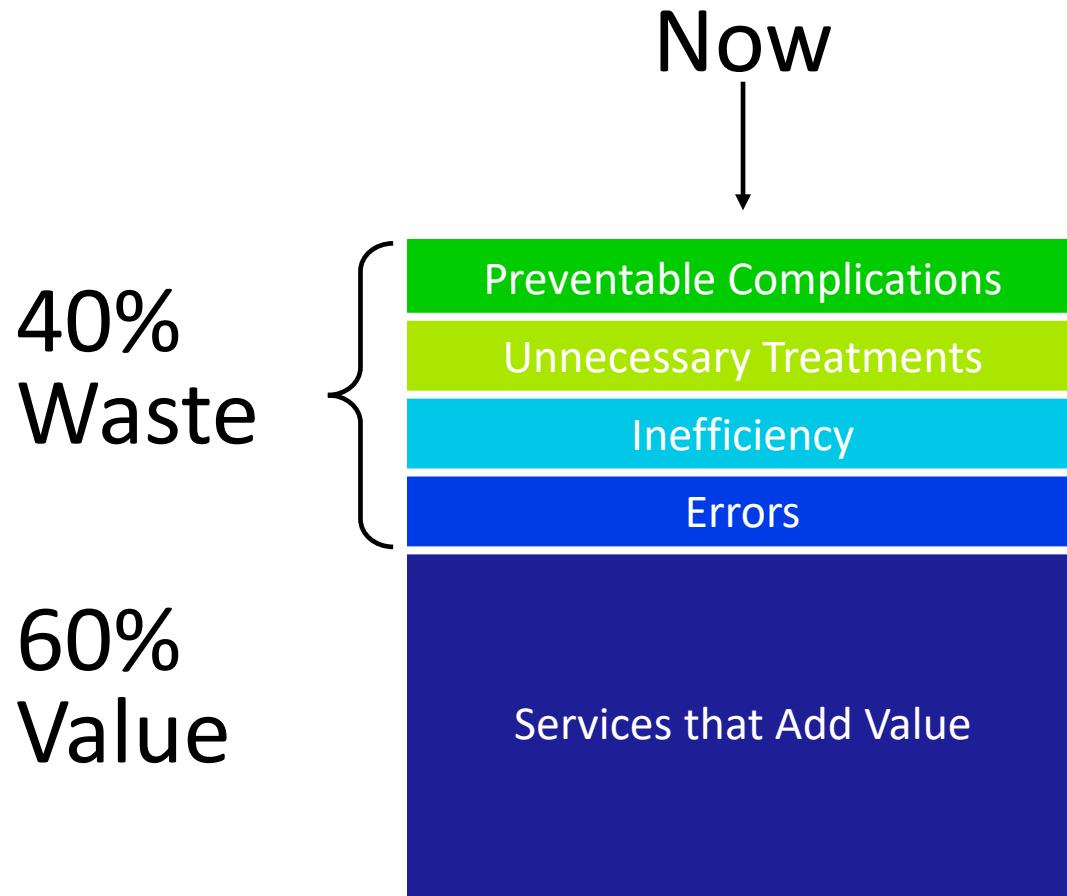
THE IMPACT

October 2021

CHICAGO—Aspen Dental, the nation's largest branded network of dental offices in the U.S., celebrated a major milestone with the opening of its 700th office in Nokomis, Florida. The opening brings the total number of Aspen Dental locations in Florida to 100.

Aspen Dental Opens 700th Office

What if Medical/Dental Costs Could be Contained?



Cost Cutting Trends with Benefits?

1. Insurance & governments require more prevention procedures to reduce costs!

- Fewer restorative procedures!



2. Insurance provides patient incentives

How will this change the world of dentistry?



What if “your” business model is disrupted?

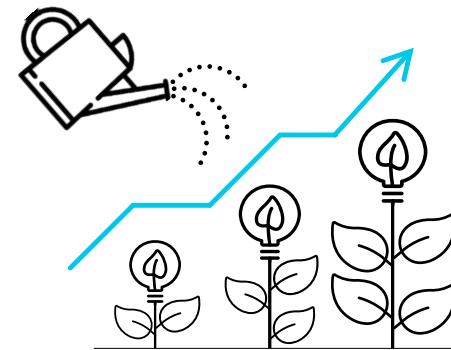
Dentistry: Increasingly Competitive!



Decline in specialists...more generalists!

Entrepreneurial dentistry and new business models will win!

- ✓ Offer treatment solutions rather than treatment plans
- ✓ Treatment is an investment rather than a cost
- ✓ Offer new dental services and treatments



What if unexpected business models become reality?

Who could have **BOTH** the medical and dental data?



“Millennial Minute Clinic”

Faster, more convenient solutions

minute
clinic®
“dental”?

Expect the Unexpected!!!

“Health care continues to evolve as patients demand more choice, greater value, and better access”

Si
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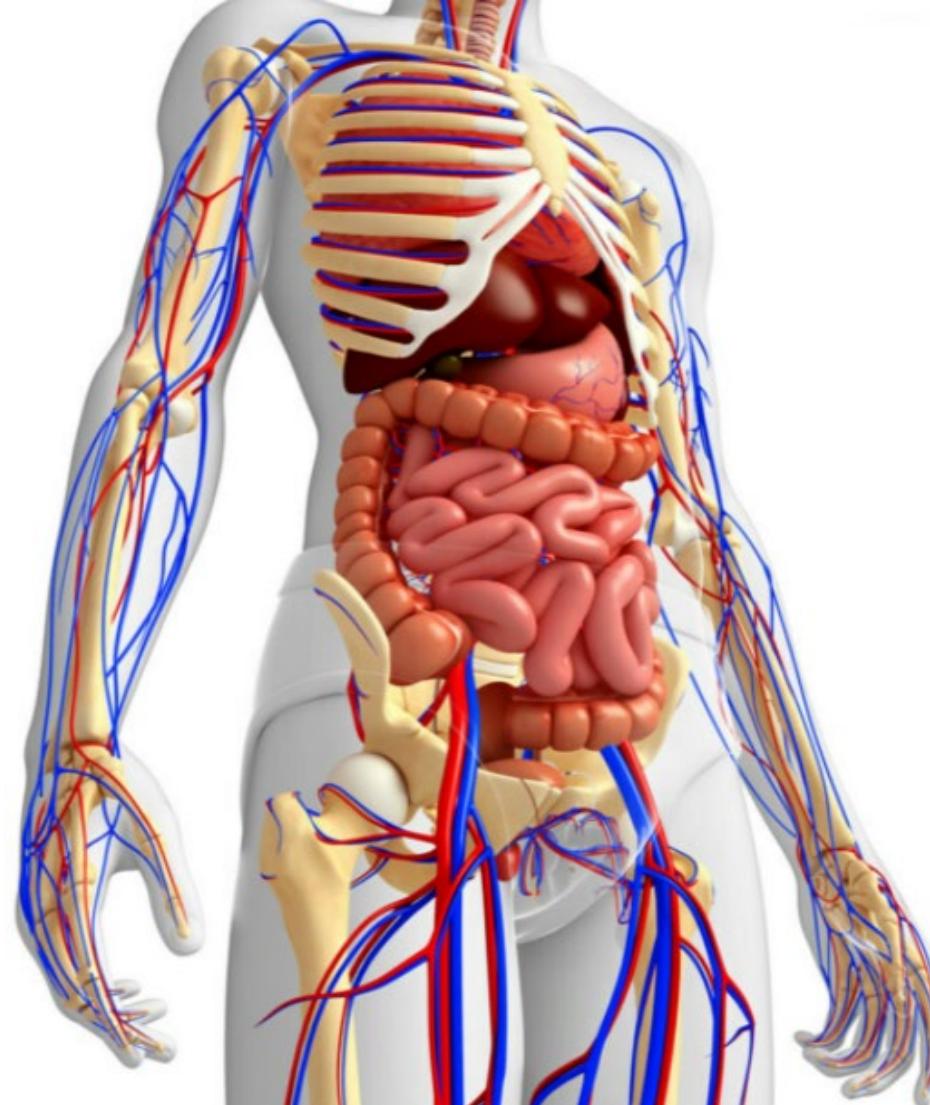
Oh by the way...

Mental Health

Hearing Exams

Eye Exams

Dentistry



Oral Health...Systemic Health

What conditions could poor oral health cause?

8/20/2020

Gum disease associated with higher gastrointestinal, colon cancer risk | News | Harvard T.H. Chan School of Public Health

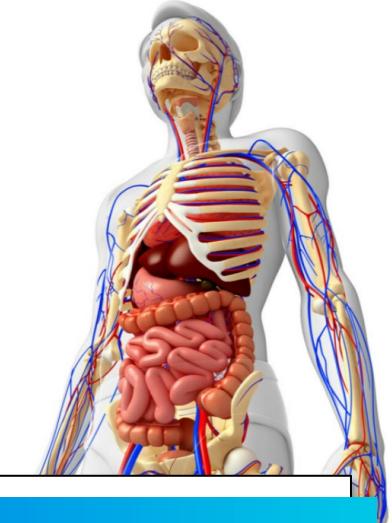


News

Gum disease associated with higher gastrointestinal, colon cancer risk



MEDICAL
DENTAL



Who owns these healthcare conditions? Dentists or Physicians or ?

developing
factors," s
and nutriti

activation of integrin signaling are
therapeutically reversible by a probiotic
bacteriocin

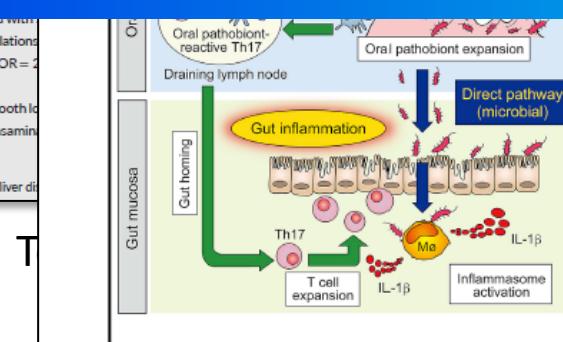
Pachiappan Kamarajan^{1,2}, Islam Ateia³, Jae M. Shin^{4,5}, J. Christopher
Charles Le¹, Ling Zhan¹, Ana Chang⁷, Richard Darveau^{6,7}, Yvonne L. Kapi

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Wenzhou Basic Research Project, Grant/
Award Number: Y20180851

95% CI = 1.01 – 1.10) with a linear relations
tendency towards liver cirrhosis risk (OR = 2.0
was no statistical significance.
Conclusion: Periodontal disease and tooth lo
eases including NAFLD, elevated transamin
KEY WORDS
cirrhosis, liver cancer, non-alcoholic fatty liver di

Bad Breath



In Brief

Periodontitis leads to expansion of pathobiont members of the oral microbiota, which promote colitis via colonization of the gut as well as induction of migratory Th17 cells, constituting a dual microbiome and immune mechanism linking oral and gut health.

Heart
Diseas

1 Department of Orofacial Sciences, School of Dentistry, University of California, San Francisco, CA, United States of America, 2 Department of Periodontics and Oral Medicine, School of Dentistry, University of Michigan, Ann Arbor, MI, United States of America, 3 Department of Oral Medicine and Periodontology, Mansoura University, Mansoura, Egypt, 4 Department of Cariology, Restorative Sciences, and Endodontics, School of Dentistry, University of Michigan, Ann Arbor, MI, United States of America, 5 Department of Epidemiology, School of Public Health, University of Michigan, Ann Arbor, MI, United States of America, 6 Biologic and Materials Sciences, School of Dentistry, University of Michigan, Ann Arbor, MI, United States of America, 7 Department of Periodontics, Oral Health Sciences, School of Dentistry, University of Washington, Seattle, WA, United States of America

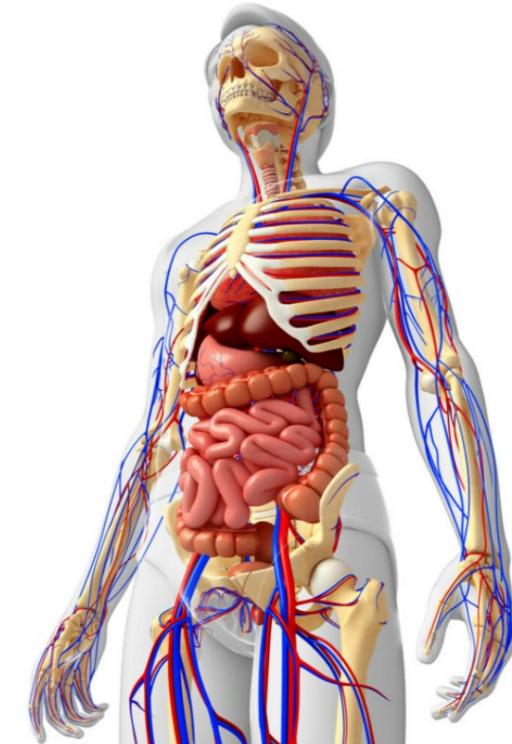
Medicine and Dentistry: How to Undo an Illogical 150-Year Divide?

Sachin H. Jain **Forbes**: November 2018



Imperatives for Integrating Dental and Medical Care

1. A new mindset
2. New clinical practice models.
3. New payment models
4. Improved “shared” information systems
5. Improved outcomes measurement



How to accelerate and remove barriers?

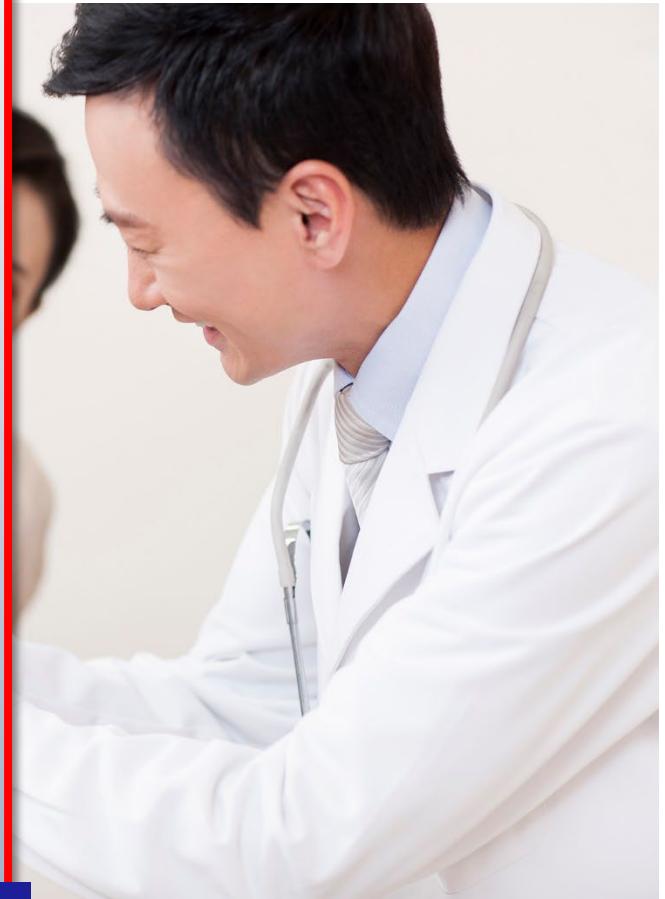
Forbes

Integration of Dental Care and Medical Care: **When, Where?**

Who could have BOTH the medical and dental data?



*Inside Dentistry, April 2021,
Volume 17, Issue 1
Published by AEGIS*



What are potential motivations and implications?



Brings Shared Dental-Medical Health Record overcoming a key barrier!



- Columbia University Irving Medical Center has implemented Epic: 1st time that dental records for patients at the [College of Dental Medicine](#) will be part of an institution's electronic health record.
- *This single EHR means patients will have the most comprehensive look into their overall health.*
- Providers will deliver care to patients using an integrated medical-dental record that offers a full view medical history, allergies, medications, etc

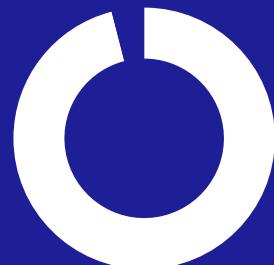
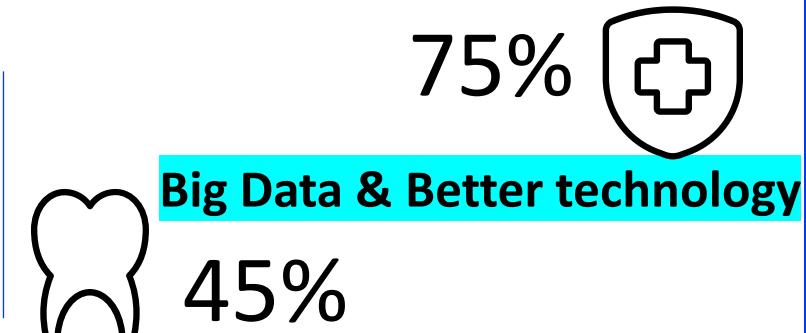
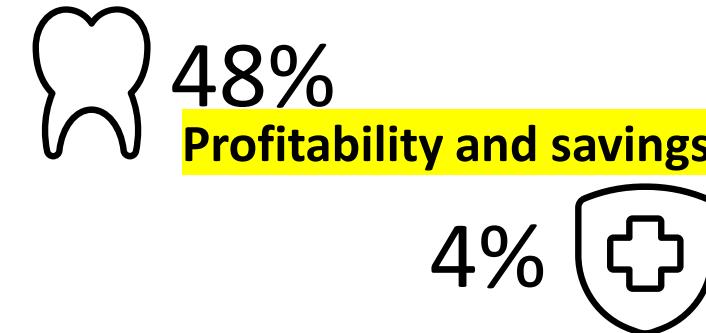
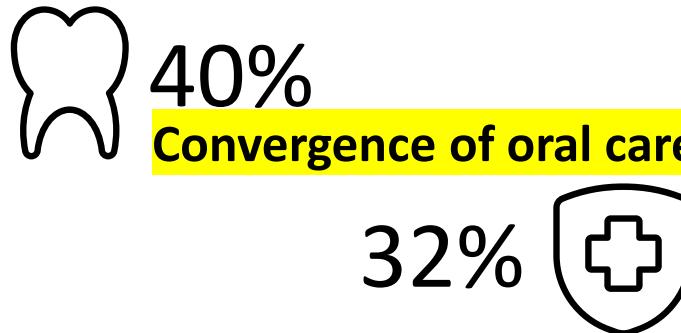
What are the possible
implications and motivations?



Survey: Embedding dental benefits in medical plans is on the way

Driving Forces

What will drive the embedding of dental into health benefits?

 96%

Of health care executives believe that embedding dental benefits in medical plans “is already happening or will happen eventually

Oh by the way...



89% of young children see a pediatrician

VS.

1.5% dental professionals

What if ?

Pediatrician a Hero for Kids' Dental Health

Dr. Amos Deinard, University of Minnesota Medical School



StarTribune

November 18, 2015

- Tooth decay is a silent epidemic in this country
- It doesn't kill a lot of people
- Kids miss school due to an infected tooth, pain so bad they can't study



Pediatric Medical Groups Using Fluoride Varnish

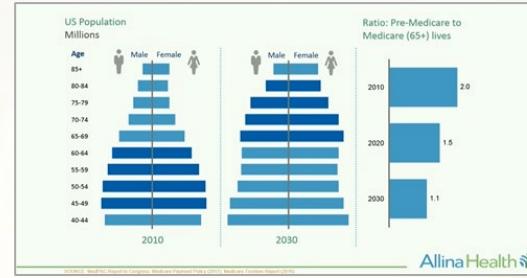
- 20 HealthPartners clinics have offered fluoride varnish 6+ years
- 38 Fairview Health Services offer it
- Allina Hospitals and Clinics started offering it about a year ago
- HealthEast
- Mayo Clinic



Aging and Medicated Population

Oral conditions with aging population

- Xerostomia
- Roots caries
- Sensitivity
- Oral cancer
- Periodontal disease/Gingivitis
- Halitosis
- Cracked tooth



Need for alternative delivery models (products and services)

- Assisted living
- Home care
- Caregiver/family
- Mobile dental care

Need for faster, easier caregiver friendly delivered products

Are these dental or medical issues?



Climate change and oral health?

D.M. Hackley, Int. Dent. J. Sept 2020

Harvard: Instructor in Oral Health Policy and Epidemiology

- Excessive heat exposure
- Poor air quality
- A lack of clean, safe water and food
- Extreme weather
- Vector-borne diseases
- Social factors
- Infectious disease (drug resistance)



What will be the unintended consequences?

Aerosols in Dentistry....do we need to be concerned?

How soon we forget!

- Viruses
- Bacteria
- Fungi

Interactions?



2/3 of dental services involve an aerosol procedure –
Mainly Fillings, Crowns and Hygiene Procedures¹



Dental handpieces, ultrasonic scalers, air/water syringes and other high-speed instruments



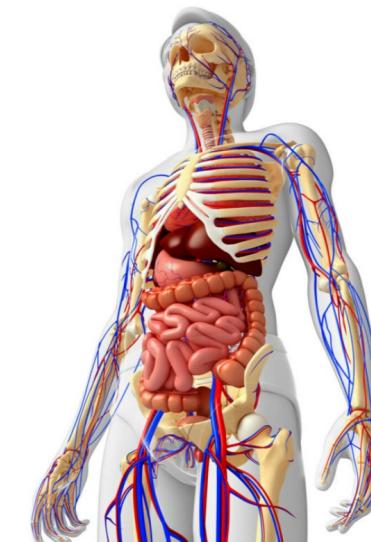
Figures: 1. Air polishing of braces 2. Air-water unit 3. Simulated dental procedure spatter² 4. Dental drill 5. Air-water unit 6. Ultrasonic scaler

Five Trends That Will Impact Dentistry

May 2019, R Gawel



1. The Aging Population
2. Corporate Dentistry
3. The Dental-Medical Connection
4. Risk-Based Models: New models are emerging...emphasizing preventive care
5. A Focus on Quality and Value

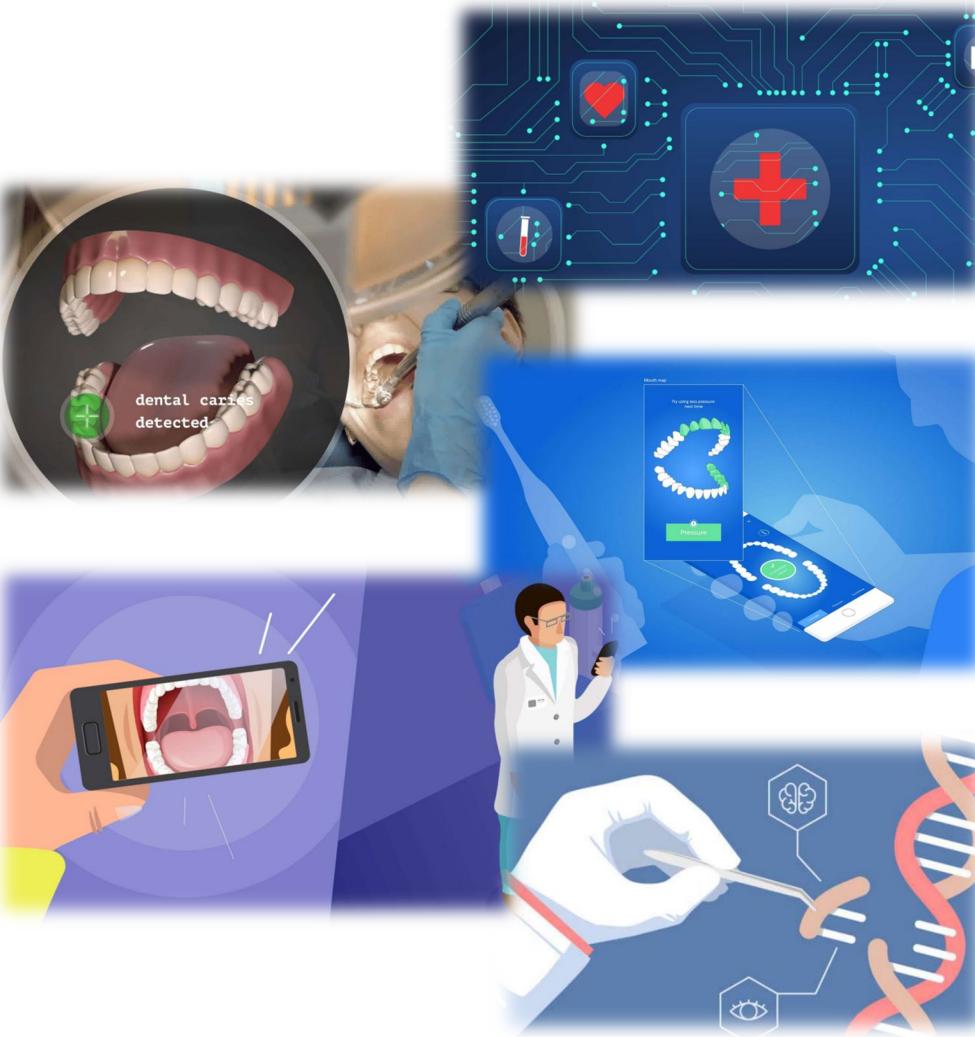


10 Technologies that will shape the future of dentistry

The Medical Futurist, April 2022



1. Artificial Intelligence
2. Smart Toothbrush
3. Augmented reality
4. Virtual Reality
5. Teledentistry
6. Computer Assisted Design and 3D Printing
7. Intra-oral Camera
8. Regenerative Dentistry
9. CRISPR
10. Robotics
11. ??????????????????



“Growth and Comfort Cannot Co-Exist!”

Will You be the
Disruptor or the **Disrupted**?

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What should you be doing to
create your future?



