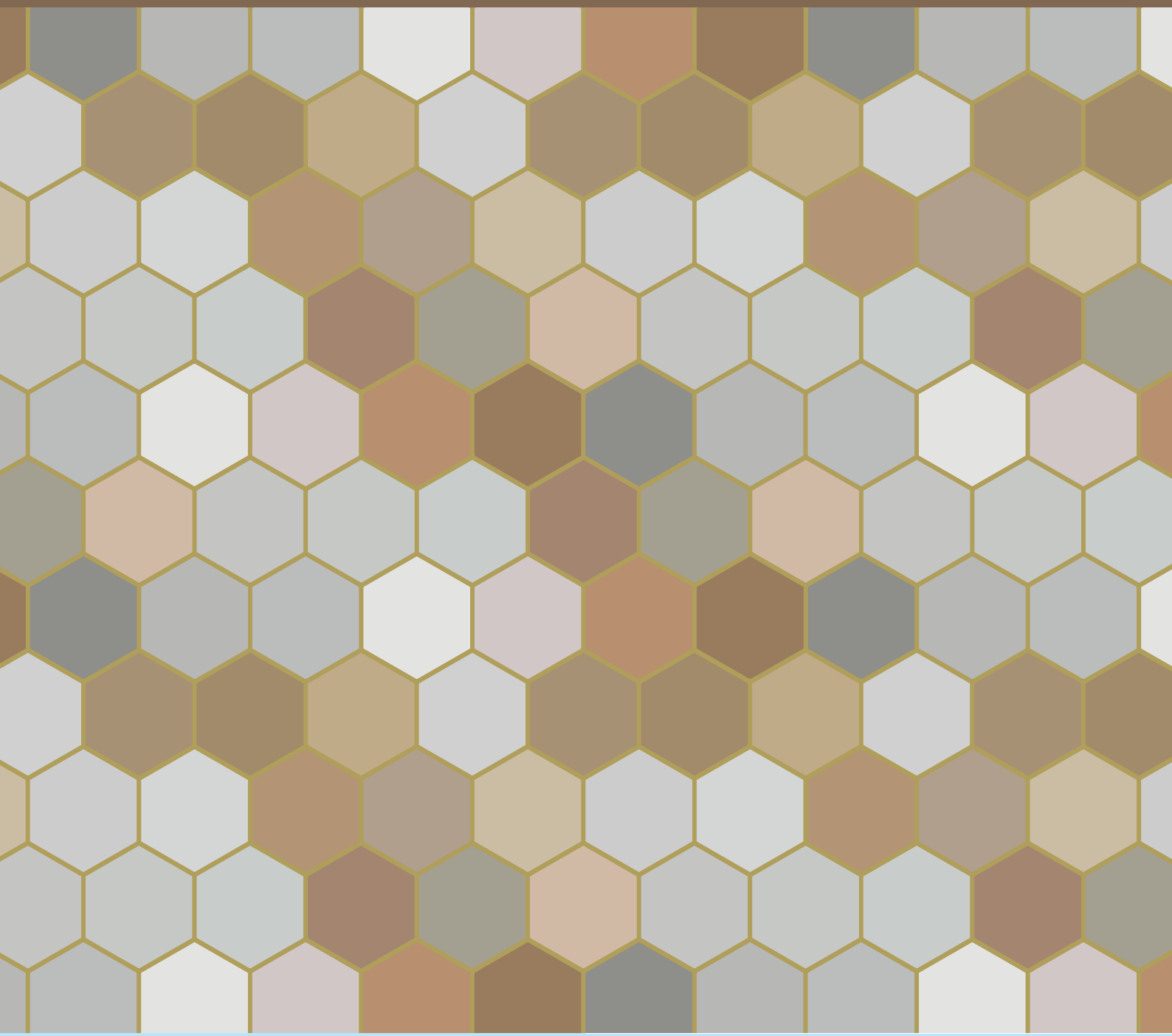
the DENTAL SURGEON

JUN 2021 ISSUE



LION

Systema

Interdental Brush

Removes 95% of plaque+

+When using together with toothbrushing

Try attached sample

Gum Problems could increase risk of Health Conditions[1]

[1]Sources:
Periodontology 2000, Vol. 44, 2007, David W.P. Nadine. B & Timothy C. N, 113-126; Bryan S.M & Robert. D, 103-112; Brian L. M & Gloria L. O, 127-153.

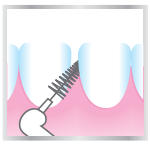
Systema The Gum Care Expert

Healthy Gums, Healthy Teeth, **Healthy You!**

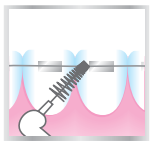
Using advanced dental technology from LION - Japan's No. 1 Oral Care Company*, Systema, The Gum Care Expert provides complete superior gum protection to help keep your gums, teeth and body healthier.

- **Toothbrush** : Removes plaque efficiently with Super-Tapered Soft & Slim Bristles. Improve gum health in 7 days^.
- **Toothpaste** : Contains powerful anti-bacterial agent – IPMP. Proven to help kill 99.99% of gum problem-causing bacteria**.
- **Mouthwash** : Alcohol free. Anti-Bacterial. Helps provide long lasting gum protection.
- **Interdental Brush** : Removes 95% of plaque+ between teeth & gums and provides protection against gum problems.

Small Medium



Spaces in between teeth



Spaces in between braces & teeth

Spaces in between bridges

^ Systema Super-Tapered Soft & Slim Toothbrushes help to improve gum health in 7 days with proper toothbrushing twice daily. Results may vary.

** Based on Lion laboratory test. Systema Gum Care Toothpaste (Breezy Mint/Icy Cool Mint/Sakura Mint) is proven in helping to kill 99.99% gum problem-causing bacteria. Gum problem-causing bacteria refers to bacteria inhabiting in the BioFilm - Porhyromonas gingivalis, Fusobacterium nucleatum, Veillonella parvula, Actinomyces viscosus.

+ When using together with toothbrushing. Source: Journal of Japanese Society of Periodontology 78-258 (1975).

* INTAGE SRI+, No.1 Company in Oral Care Category, Value Sales, CY2020.

LION CORPORATION (S) PTE LTD (A wholly-owned subsidiary of Lion Corp., Japan) www.lioncorp.com.sg

LION Japan's No.1 Oral Care Company*

EDITOR'S NOTE

Dear Reader,

With each edition of ***The Dental Surgeon,*** I try my best to push the envelope.

The envelope contains the deed of editorship of this magazine, but whomever I push it to, it gets pushed back harder than before.

For 2021, our team has taken on a laser focused approach to this publication. We believe that ***The Dental Surgeon*** should be managed like you should your love life:

- Keep things interesting
- You gotta be a little naughty
- You could always use more paprika

Yours Sincerely
Jeremy Sim

DR JEREMY SIM *has emerged from his bond with the government and is currently fending for himself in the real world. He currently practices as a General Dentist in Orchard Scotts Dental. He is currently seated in front of his PC trying to write about himself in the third person to no avail.*

IN THIS ISSUE

4
eLAB Prime: Uncompromised Shade Matching
by Dr Alvin Chai

14
SDA Convention 2021: Navigating The Confluence Of Digital Technology and Biologics
by Dr Jeremy Sim

22
Burnout in Dentists working in Singapore — A Cross-Sectional Study Summarized
by Dr Surinder Arora

34
Three Buns — Our Journey Into Alternative Meats
by Dr Jeremy Sim

43
Teeth Through The Lens: Dental Camera Set-Ups
by Dr Lea Tan

The Dental Surgeon

320 Serangoon Road, #10-13 Centrium Square, Singapore 218108,
T: +65 6258 9252, F: +65 6258 8903, tds@sda.org.sg, www.sda.org.sg

The contents of this publication may not be reproduced either in part or full without the consent of the copyright owners. Articles published express the viewpoints of the authors and does not necessarily reflect the views of the editorial team and publishers of the publication.

Designed and printed by ColorMagic Pte Ltd

MCI (P) 005/10/2020

CONVENOR

DR GOH SIEW HOR graduated with a Bachelor of Dental Surgery from NUS in 2008. He is presently the Assistant Director at NTUC Health where he heads the Dental and Family Medicine services. He is a Visiting Consultant and Member of the Medical Advisory Committee at St Luke's Community Hospital and President of the Singapore Dental Health Foundation. He currently practises at Unity Denticare.

ASSISTANT EDITORS

DR ROBERT BURGESS is currently studying to be an endodontist. He hopes to continue to contribute to *The Dental Surgeon*'s growth as a publication. Robert spends his free time trying to keep his pet corgi alive.

DR LEA TAN is currently serving the second year of her bond. She dreams of traveling the world and showing off her collection of lipstick. Outside of dentistry, she has many hobbies from knitting to learning Spanish. She is happily mediocre at them all, hopefully excluding writing.

Pearlie White®

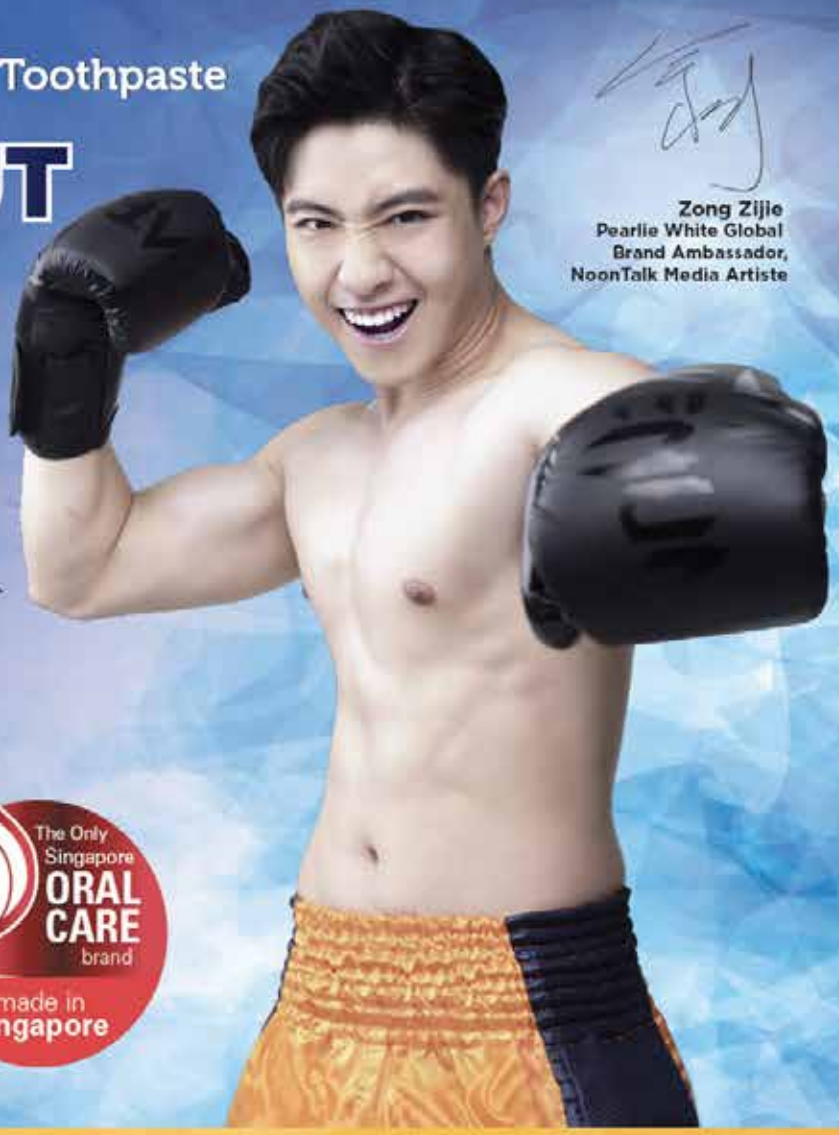
Advanced Whitening Fluoride Toothpaste

KNOCKS OUT

TOOTH STAINS

PLAQUE

BAD BREATH



Zong Zijie
Pearlie White Global
Brand Ambassador,
NoonTalk Media Artiste

Enhanced Formula
+10 natural ingredients
for added benefits!

The Only Singapore ORAL CARE brand
made in singapore

Advanced Formula, enhanced with 10 natural ingredients for greater antibacterial, anti-inflammatory & antioxidant benefits.

Clean Formula that does not contain undesirable ingredients.

Effective Formula that helps remove tooth stains, fight plaque & freshen breath.

NO PARABENS · NO TRICLOSAN · NO PPG/PG/PEG · NO SODIUM LAURYL SULFATE (SLS) · NO SACCHARIN · NO PEROXIDE · NO TITANIUM DIOXIDE

www.PearlieWhite.com /pearliewhite | pearliewhiteglobal

eLAB Prime: Uncompromised Shade Matching

BY DR ALVIN CHAI

The single anterior tooth crown/veneer has always been a challenge in aesthetic dentistry. We have come up with several workarounds but have yet to have a defined, reproducible solution. Often, we end up replacing a full set of anterior teeth, sacrificing pristine tooth structure. Otherwise, we fabricate a crown and expect to have a couple of revisions before settling for something satisfactory, increasing precious chair time and lab costs.

With eLAB, however, these problems may soon be a thing of the past. I sat down with Mr Alvin Chai, co-partner of Digital Dental Lab, to find out more about this modern workflow which aims to ease the process of shade matching.

Tell us a bit about yourself.

My name is Alvin Chai and I was born and raised in Malaysia. The profession of a dental technician was not my first choice. After successfully completing a bachelor's degree in building surveying at the University of Malaya in Kuala Lumpur, I changed industries. After graduating in 2008, I realized that this

career path was not for me. So, I decided to take up the position of a dental technician at my uncle's dental laboratory. After almost two years of training, I wanted to deepen my knowledge and skills. I applied to be a student at TAFE in Sydney, Australia, and graduated in 2012 with the International Student Certificate of Excellence.

Returning to Singapore in 2012 as a trained Dental Technician, I continued my passion in a few mass production dental laboratories focusing on CAD/CAM & all ceramic restorations. There, I saw the importance of technology that could bring benefits & opportunities in a business setting. In the following years I also studied part-time at the Kaplan Higher Education Academy Singapore and graduated with the "Advanced Diploma in Business and Management" (2016) and a "Bachelor of Arts in Business Administration" (2018). Since then, I have strived to achieve a mastery of skills, technique (analogue) and correlation with digital technology to make the work processes more predictable, cost-effective and efficient. I believe the transferable skills between analogue & digital dentistry is the key to improving the overall work performance between clinician & technician.

What are the difficulties in traditionally matching single anterior tooth crowns?

Color matching always has been a formidable challenge because it is a matter of high subjectivity. Every individual will have their own perception of how an A1 or A2 shade should look. It is a matter of human perception and the appearance of colour differs from viewer to viewer. The dimensions of colour: hue, value & chroma, also coexist simultaneously. It is almost impossible for the human eye to judge them separately in an accurate fashion.

In the past, we used to rely heavily on visual assessment when it came to clinical shade matching. Back then, the only tool that we had was the Vita stock shade guides. In the process we often neglect the importance of a standardised work flow.

For example:

- Incorrect optical axis of the camera
- Irregular exposure levels of photo
- Varying room lighting condition during photo shoot
- Incorrect orientation of the shade tabs to the natural dentition
- Incorrect shade tab selected for reference
- Incompetent photo taking techniques

Unfortunately, we often assumed that the single photo sent to the technician would suffice to fulfill the restorative requirements of both patient and clinician. In reality, this would only be achievable with a master magician and not even a master technician. The truth is that 8 in 10 cases will fail due to the limitations and variables mentioned.

In addition, research papers have also found out that stock shade guides actually do not hold much significant relevance to natural teeth colour, as all of them are:

- Inadequate in terms of range of colour description
- Lack colour consistency between shade guides used in the lab and the dental office
- No industry ISO standard (every manufacturer has their own ideal on how an A3 or A2 shade should look like). Different manufacturers will have a different colour yield.

On top of all that, literature also confirms that none of the shade guides effectively covers the *a axis (red colour) of natural dentition. Meaning to say, they are all either:

- Too bright or too dark
- Too yellow or not yellow enough
- Do not have enough red tones to begin with

In addition to this, there is also a variation in dental ceramics. Research papers have shown a comparison between various brand samples of the same shade measured against Vita classical shade guides. The result that is none of them actually matches the Vita classical shade, and each brand presented with a huge colour difference reading. Thus, as a dental technician, it will still have a significant colour difference relative to Vita shade guides regardless of ceramic brand.

This is why traditional methods of colour matching single anterior crowns are really challenging. This problem has not changed since the 1950s. Moving forward, this is one of the problems we should solve to overcome the limitations in traditional dentistry.

What is eLAB?

The eLAB protocol comprises of 3 major aspects.

We first have *acquisition*, by means of DSLR or mirrorless cameras.

Next is handling of the *elabprime software*. This where we perform color quantification instead of qualitatively describing colors. Thus, strict photography protocols have to be followed to produce high quality raw files. These files are loaded into the software to immediately identify the *L, * a and *b values to generate a special mixing recipe for the ceramic prosthesis that is to be built.

Once finished, we will then use the software again to do a digital try-in to measure how close we are in terms of color. Basically we are comparing two pictures:

- picture with finished crown taken on the workbench with a grey reference card
- picture with natural teeth taken intraorally with grey reference card

The comparison of these two calibrated pictures tells us the range of color accuracy with the help of color difference threshold reading.

This is by far the most powerful tool of the software, where it allows us to do a try-in without even seeing the patient. From the digital try-in, we will be able to gauge the colour accuracy of the prosthesis without even seeing the patient. If, at this stage, the quality of the prosthesis is deemed to be poor; the patient can easily be rescheduled and the prosthesis can be remade. This is a tremendous breakthrough in workflow that saves cost and chairtime, enhancing the experience for both clinician and patient.

The final stage is to *manufacture* the prosthesis. This is where we turn our ideals into a reality. Here is where dental technicians will use the information gathered so far to produce the prosthesis.

The eLAB Photographic Protocol (www.elabprime.com):

https://elabprime.com/wp-content/uploads/2021/05/Photo_Prot_EN.pdf

Clinical Case 3: #11 Single tooth implant-retained crown

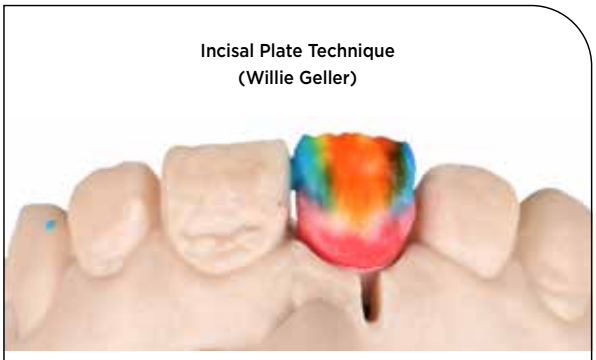
Temp Implant crown in place

Polarised Picture with gray card

Soft tissue contour important in colour control

3 Shape Scanning with Straumann Scan body

Incisal Plate Technique
(Willie Geller)



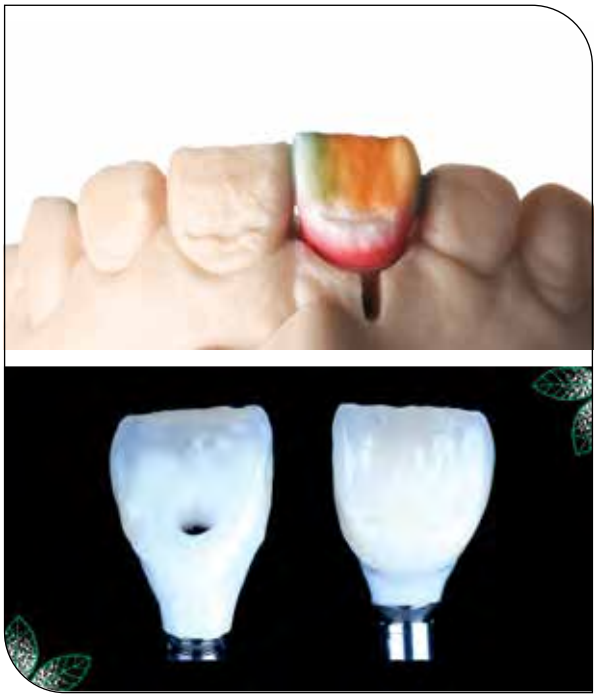
Mesial and Distal Ridges

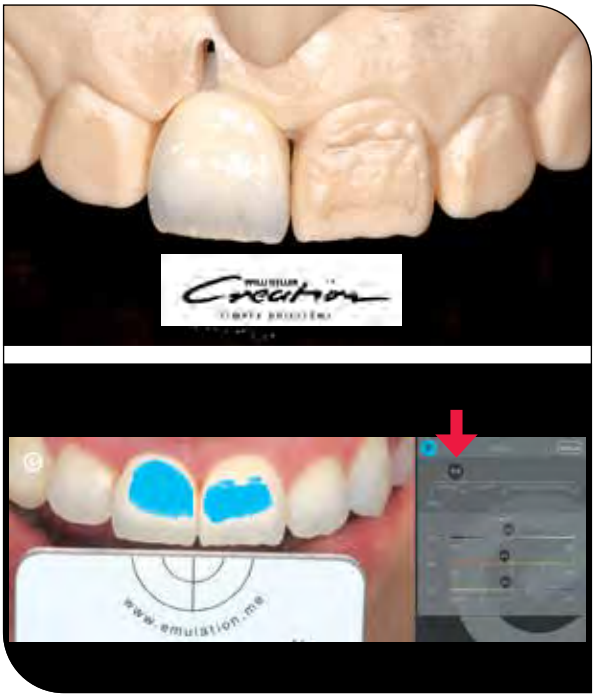
eLAB dentin

eLAB transition dentin

Intermediate segment layer

Enamel Skin with
Surface Texture + HALO





References

Hein.S. Natural Magica: The Magic of Nature. Quintessence, 2009 pg 134-135

Grow.V & Djemal Ibrahimi (2014) DTG Magazine: Issue three. Retrieved from : https://www.dentaltechniciansguild.com/my-library/

Bhat V, Prasad DK, Sood S, Bhat A. Role of colors in prosthodontics: application of color science in restorative dentistry. Indian J Dent Res. 2011 Nov-Dec;22(6):804-9. doi: 10.4103/0970-9290.94675. PMID: 22484875.

Westland et al: Color Assessment in Dentistry. Vol 3. 2007, No.4, pp1-10

Todorović A, Todorović A, Gostović AS, Lazić V, Milicić B, Djurisić S. Reliability of conventional shade guides in teeth color determination. Vojnosanit Pregl. 2013 Oct;70(10):929-34.

Paravina RD, Pérez MM, Ghinea R. Acceptability and perceptibility thresholds in dentistry: A comprehensive review of clinical and research applications. J Esthet Restor Dent. 2019;1–10.

Bayindir F, Kuo S, Johnston WM, Wee AG. Coverage error of three conceptually different shade guide systems to vital unrestored dentition. J Prosthet Dent. 2007 Sep;98(3):175-85. doi: 10.1016/ S0022-3913(07)60053-5. PMID: 17854618; PMCID: PMC2001247.

Hein S, Tapia J, Bazos P. eLABor_aid: a new approach to digital shade management. Int J Esthet Dent. 2017;12(2):186-202. PMID: 28653050.

Hein S, Zangl M. The use of a standardized gray reference card in dental photography to correct the effects of five commonly used diffusers on the color of 40 extracted human teeth. Int J Esthet Dent. 2016 Summer;11(2):246-59. PMID: 27092350.

Shot with grey card

The Final Crown

MR ALVIN CHAI *is a certified dental technician who is a co-partner at Digital Dental Labs. He is a proponent of using digital dentistry to overcome adversity in the dental workplace. He is frustrated that colour matching with single anterior crowns still presents as an insurmountable challenge that has yet to be predictably solved. Where do we go from here?*

DIGITAL DENTAL LAB

LISTERINE®

THE WORLD'S #1 MOUTHWASH BRAND

LISTERINE KILLS 99.9% OF BACTERIA**

*Euromonitor, Mouthwash category, 2019 data
**bacteria that cause bad breath, plaque and gum problems

KILL 99.9% OF BACTERIA IN 30 SECONDS

Unique formula that extracts toxins

3x lesser plaque*

* vs brushing alone

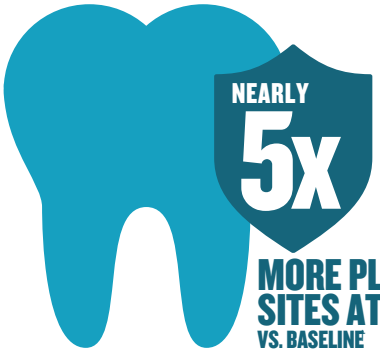
Kills odour-causing bacteria

Kills germs that cause bad breath, plaque and gum problems

Minty flavour for fresh breath

YOUR PATIENTS ARE ONLY DOING HALF THE JOB WHEN THEY BRUSH & FLOSS

Patients who added LISTERINE® to mechanical methods had



MORE PLAQUE-FREE SITES AT 6 MONTHS VS. BASELINE

BOLD PROOF IT'S POSSIBLE:

- The antimicrobial action of LISTERINE® comes from its unique formula, which contains fixed combination of 4 essential oils
- These essential oils deeply penetrate into the bottom layers of the plaque biofilm, breaking down its structure [2-4]
- Boldly going beyond the reach of both brushing and interdental cleaning, LISTERINE® is the essential third step in twice-daily oral care

References: 1. Based on a meta-analysis in Araujo et al and/or post-hoc study analyses. 2. Foster JS, Pan PC, Kolenbrander PE. Effects of antimicrobial agents on oral biofilms in a saliva-conditioned flowcell. *Biofilms. 2001;1:5-12.* 3. Minah GE, DePaola LG, Overholser CD, et al. Effects of 6 months use of an antiseptic mouthrinse on supragingival dental plaque microflora. *J Clin Periodontol.* 1989;16:347-352. 4.Walker C, Clark W, Wheeler T, Lamm R. Evaluation of microbial shifts in supragingival plaque following long-term use of an oral antiseptic mouthrinse. J Dent Res. 1989;68:412.

SDA CONVENTION 2021
1ST MAY 2021
Orchard Hotel Singapore
Navigating the Confluence of
Digital Technology and Biologics

SDA Convention 2021: Navigating The Confluence Of Digital Technology and Biologics

BY DR JEREMY SIM

SDA CONVENTION 2021
1ST MAY 2021
Orchard Hotel Singapore
Navigating the Confluence of Digital Technology and Biologics
Welcome Address

The call of the koel broke through the dawn. I drew the curtains and shouted in a dream-like stupor at the blaring alarm clock perched upon the tree outside my window. It was 6 o'clock in the morning. The last time I had woken up that early was for Christmas morning, back when I believed Santa Claus was real back in 2008.

We had received orders from the SDA Convention 2021 Organizing Committee to arrive at the scene promptly at 7am. Like the loyal minions we were, we did; only to find out that we were probably not needed until an hour later. I shall forever hold a grudge against the individuals who had deprived me of an additional hour of sleep. May your initial attempts at taking your final impressions always be cursed with a singular bubble present on the restorative margins. May you then take a full minute to deliberate whether to redo the impression taking or to throw caution to the wind.

It was an unfamiliar sight to witness guests, in their full human forms, fill the convention space. Over the course of the last 12 months, I had grown accustomed to sitting half-naked in front of my webcam (think about it) to catch up with Continuing Dental Education.

Guests were split into 4 zones. Cross zonal interaction was strictly prohibited. Each zone had 10 tables of 8 people each. Ushers wielded leather whips and flying ninja stars to enforce safe distancing measures. Unfortunately, they never had to be used.

Dr Goh Siew Hor, the President of SDA, kicked off the event with a welcome speech. The lectures by Dr Bryan Harris and Dr Alex Fibishenko were carried out remotely via tele-conferencing. Q&A sessions were also held remotely.

A/Prof Vinicius Rosa, A/Prof Patrick Tseng, Dr Wong Li Beng and Adj A/Prof Benjamin Tan gave their lectures in the flesh. It was an odd, yet refreshing experience to be present at a live lecture surrounded by peers.

For obvious reasons, refreshments were not served buffet-style; but were served directly to our tables by the hotel waitstaff.

PERI-IMPLANTITIS:
FROM ASSESSMENT USING DIGITAL DENTISTRY TO MANAGEMENT
NUHS
SINGAPORE DENTAL ASSOCIATION CONVENTION 2021
May 2021
Dr Wong Li Beng
BDS, MDS (Periodontology), MRD RCS (Edinburgh), FAMS
Senior Consultant, Head of Division, Preventive Dentistry
Ng Teng Fong General Hospital
National University Health System

2010 – 2012: Universi
2012 – 2019: Assistant Profess
2013 – date: NUS Centre for Ac
Graphene Research Centre
2018 – date : Department of Ma
2019 – date: Associate Profess
2019 – 2020: Assistant Dean R
2020 – date: Vice Dean Resear

Managing Full and Partial Thickness Flaps with a Focus on Histology
Adjunct A/Prof. Benjamin T.K. Tan

straumann
Straumann® BLX Implant System
Confidence beyond
Immediacy

TePe
Sustainable implant care
TePe

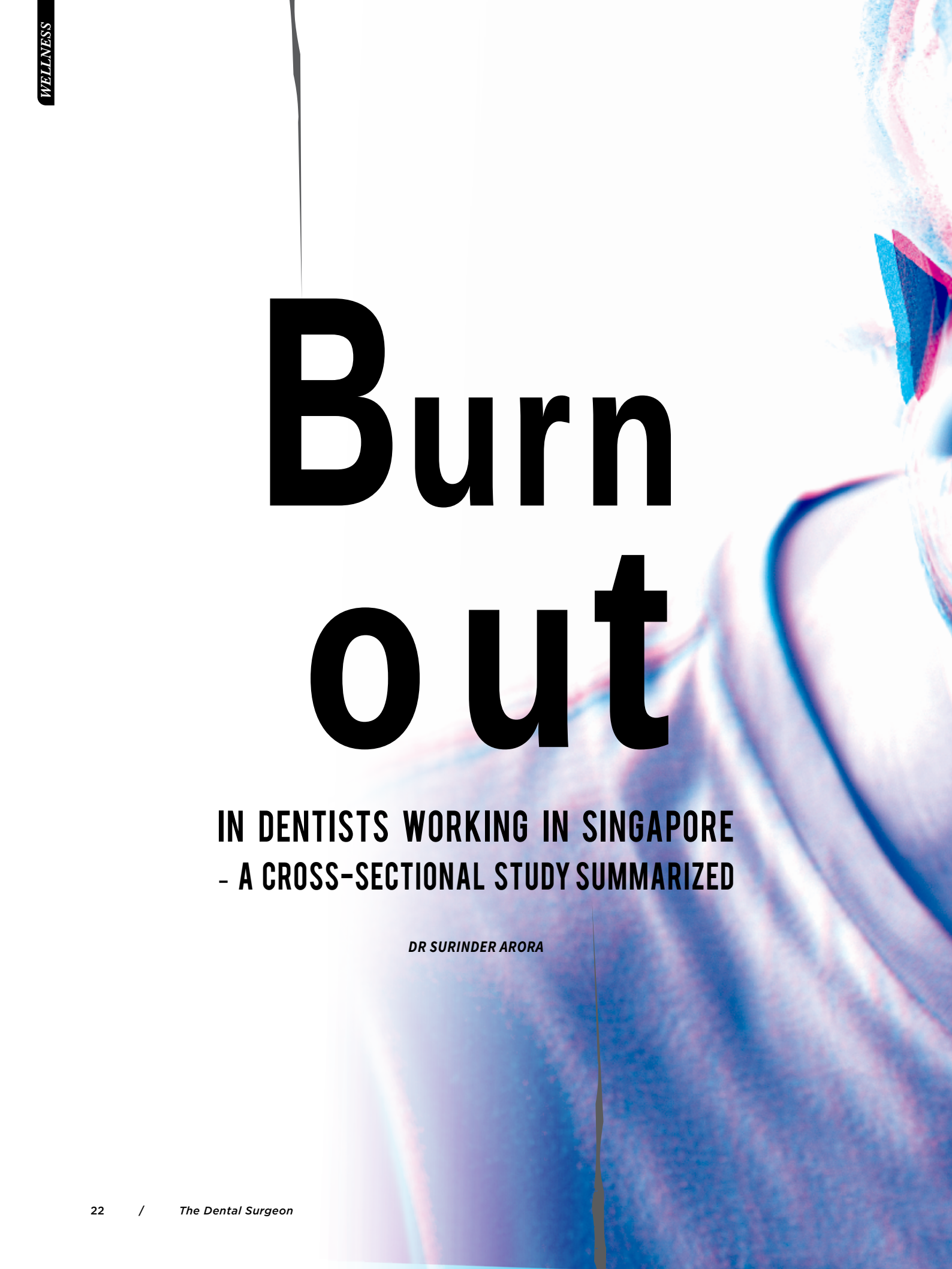
Vendor booths had a relatively small presence this year. Instead of an entire convention hall filled with dental products, only 3 vendors (Straumann, Prohealth (TePe) and Colgate Palmolive) set up booths at the event ground. Each vendor had to set up booths both in the foyer and in the ballroom to ensure safe distancing among attendees.

DR JEREMY SIM *has emerged from his bond with the government and is currently fending for himself in the real world. He currently practices as a General Dentist in Orchard Scotts Dental. He is currently seated in front of his PC trying to write about himself in the third person to no avail.*

Burn out

IN DENTISTS WORKING IN SINGAPORE - A CROSS-SECTIONAL STUDY SUMMARIZED

DR SURINDER ARORA



Back in January 2020, you may have noticed a survey on 'dentists and burnout' parked in your SDA Buzz newsletter. Dentists around the world have been struggling with stress and burnout for a long time and historically the literature was missing data for Singapore. This survey was an effort to gather some information about our stress and burnout levels as part of a MSc project. With the chance to win a night in one of Singapore's 5 star hotels (which may not have been so attractive as our first cases of COVID emerged), 216 of you responded giving some insight into the burnout situation among us.

What is burnout and how does it apply to dentists?

Burnout results from ongoing, unsuccessfully managed workplace stress. Tell-tale signs of burnout include exhaustion, increased mental distance from your job, and reduced professional efficacy.

Some of the consequences of clinical burnout reported in the literature include:

- Decreased work engagement
- Reduced clinical productivity
- Reduced remuneration
- Poor quality of care
- Diminished professional standards
- Compromised patient safety
- Suboptimal patient care practices Inaccurate record keeping
- Failing to fully discuss treatment options or answer queries
- Errors in treatment and medications.

A range of risk factors for burnout reported include time and scheduling pressures, staffing issues, patient perceptions and expectations, professional concerns, pressures associated with treating patients, business stressors, seeing more than 30 patients a day and pay-related stressors.

Global Research

Reported levels of burnout among dentists varies widely, from as low as 2-3% in Spain to as high as 88% in the UK. The literature explores different groups within specialities as well general practitioners (Table 1).

Table 1: A table indicating a summary of the literature on burnout levels in dentists.

Author and year	Country and area	Setting/subgroup and sample size with respondents	Burnout inventory used	Key findings and prevalence of burnout (%)
Ab-Murat et al. (2017)	Malaysia	682 out of 842 dentists responded. 81% response rate	Questionnaire based on a conceptual framework of mental health and well-being model with a 5-point Likert scale	30.8% reported that they were 'stressed physically and emotionally' and slightly more than a third were 'easily tired' (35.8%) The majority perceived themselves as having positive mental well-being
Baran (2005)	America, Illinois	General dentists	Myers Briggs Type Indicator, Maslach Burnout Inventory (MBI), Dentist Satisfaction Survey	7.4%
Calvo et al. (2017)	United States, Boston, Pittsburg, Iowa City, and Las Vegas	167 US dentists who attended continuing education courses in the mentioned areas	MBI and Utrecht Work Engagement Scale	13.2%
Choy and Wong (2017)	Hong Kong	All dentists with 301 out of 1086 respondents – 28%	Maslach Burnout Inventory-Human Services Survey (MBI-HSS)	7%
Collin et al. (2019)	England	All dentists 2053 respondents, 13% response rate	Oldenburg burnout inventory (OLBI)	88% GDPs 83% Community dentists 65% University teaching or research 75% hospital practice
Denton et al. (2008)	UK	500 dentists selected at random	Utrecht Work Engagement Scale (UWES-17) MBI-HSS	8%

Table 1 continued: A table indicating a summary of the literature on burnout levels in dentists.

Author and year	Country and area	Setting/subgroup and sample size with respondents	Burnout inventory used	Key findings and prevalence of burnout (%)
Divaris et al. (2012a)	Switzerland	Dental residents, 36 out of 43 dental respondents – 84%	Graduate Dental Environment Stress (GDES30) and MBI	36% percent of respondents were burnout 'cases' on the personal accomplishment (PA) scale, 17% for emotional exhaustion (EE) and 8% for depersonalization (DP), overall low levels of perceived stress and burnout
Divaris et al. (2012b)	Greece	99 postgraduate students enrolled in clinical, non-clinical and PhD programmes in the Athens University School of Dentistry	Graduate Dental Environment Stress (GDES) questionnaire and the MBI	40% of the respondents were classified as burnout 'cases' in EE, while this proportion was 38% for reduced PA and 13% for DP
Gorter et al. (1999)	Amsterdam Netherlands	709 in sample with 75% response rate	MBI	3% had high overall levels of burnout
Gorter et al. (2007)	Amsterdam Netherlands	50 dentists six months and one year after graduation (76% response rate) and 6 years after grad (with extra 10 participants) 78%	MBI	Burnout appears no threat for the average newly qualified dentists but some high burnout scores reported
Gorter et al. (2010)	Amsterdam Netherlands	179 Dutch oral surgeons 70% response	MBI Dutch version UBOS	Oral surgeons have a lower risk of burnout than GDPs
Gorter and Freeman (2010)	Western Northern Ireland	300 dentists with 45% response rate	MBI, Job Demands in Dentistry measure, UWES, Job Resources in dentistry measure, and General Health Questionnaire (GHQ)	25% serious burnout risk

Table 1 continued: A table indicating a summary of the literature on burnout levels in dentists.

Author and year	Country and area	Setting/subgroup and sample size with respondents	Burnout inventory used	Key findings and prevalence of burnout (%)
Humphris et al. (1997)	Merseyside, UK	Junior dentists in dental teaching hospital 81% response rate	Occupational Stress Indicator, MBI	10%
Huri et al. (2017)	Turkey	155 dentists in teaching roles	Canadian Occupational Performance Measure (COPM)	Occupational participation level can affect burnout among dentists with teaching responsibilities
Jin et al. (2015)	Korea	All dentists, random sample of 1,000 dentists was selected from 13,207 with 444 respondents (44%)	MBI-HSS	In the subscales of burnout, 41.2%, 55.9%, and 41.4% of respondents scored highly in EE and DP and poorly for PA, respectively.
Kulkarni et al. (2016)	Udaipur, India	121 6 months- 5 years experience dentists 121 questionnaires, 97 were included in the final study (80.16% response rate)	Copenhagen Burnout Inventory (CBI) based on a 5-point Likert scale	In 26-28 year olds 47.83% felt a high degree of burnout 81.83% females burnout due to work
Martinez et al. (2008)	Spain	78 dentists University of Barcelona: Departments of Oral Surgery and Implantology, Orthodontics and Integrated Dentistry	MBI	2-3%
Murtomaa et al. (1990)	Uusimaa, Finland	Sample 232 general dentists	Questionnaire psychological fatigue, loss of enjoyment of work, and hardening	One third of dentists experienced some hardening

Table 1 continued: A table indicating a summary of the literature on burnout levels in dentists.

Author and year	Country and area	Setting/subgroup and sample size with respondents	Burnout inventory used	Key findings and prevalence of burnout (%)
Nascimento et al. (2018)	Brazil	48 out of 72 dental professors (66.7% response rate)	CBI	2.1%
Osborne and Croucher (1994)	South East England	General dentists, 340 out of 440 dentists responded (77%)	MBI	10.6%
Pirillo et al. (2011)	Italy	366 orthodontists	MBI	EE affects only 20% of the sample, DP 33% of the sample, while the PA was reported to be low in 66% of the sample.
Puriene et al. (2008)	Lithuania	GDPs, 2449 68.2% response rate	Questionnaire with Likert-type scales 1 to 5	83.6%
Shelley and Wong (1991)	Texas, United States	Military dentists 77 out of 80 respondents – 96.3% 4% female 96% male	MBI	Low to moderate levels of burnout
Te Brake et al. (2007)	Amsterdam, Netherlands	497 Dutch general dental practitioners was included (response rate of 59%)	MBI and UWES	Overall burnout levels among dentists are low, dentists have a positive working attitude
Zini et al. (2013)	Israel	Dentists and specialists with a purposive cluster sample of 320 dentists	Burnout measure short version (BMS) questionnaire	45%

The Study - Burnout in Dentists in Singapore

A cross-sectional survey was sent out via an online questionnaire. It consisted of the Copenhagen Burnout Inventory (CBI) as well as demographic and supplementary questions assessing causes and outcomes of stress and burnout. The CBI asks questions under 3 subscales: Personal Burnout, Work-related Burnout and Patient-related Burnout. The primary research objective of this study was to establish burnout levels among dentists working in Singapore.

According to the Ministry of Health, in 2018 Singapore had 2,292 actively practising dentists. Out of this number, 216 responded, 210 of whom provided complete data with an overall response rate of 9.2%. Demographic data for the sample can be found in Table 2. The majority of respondents were general practitioners in private practice.

Table 2: Demographic characteristics of the research sample including sex, age, ethnicity and job role.

	Sample population (%)	n
Sex		
Female	58.6	126
Male	40.9	88
Undisclosed	0.5	1
Age (years)		
20-29	33.3	72
30-39	30.1	65
40-49	17.1	37
50-59	10.7	23
Over 60	8.8	19
Ethnicity		
Chinese	87.0	187
Indian	7.4	16
Malay	1.0	2
Caucasian	2.3	5
Other	2.0	4
Job role (designation)		
General Dentist	87.0	187
Specialist	10.7	23
Other	2.3	5

Key findings

Some of the key findings are indicated below.

- When asked 'do you feel burnt out because of your work?' 25% (56 respondents) reported to a "high" or "very high degree", 34% (72 respondents) reported "somewhat" and 39% reported to a "low" or "very low degree".

- Average CBI scale scores (out of 100) were: Personal Burnout=49.14, Work-related Burnout=46.41, and Patient-related Burnout=37.72.

- Overall low to moderate levels of burnout were reported, with a proportion of dentists indicating they are highly burnt out.

Other findings

- There were no statistically significant differences between designations (general dentist, specialist, other) and burnout.

- The group with highest work related burnout was those with 1-5 years of experience (mean=50.4), followed in order those by less than 1 year experience, 5-10 years experience, and over 10 years experience (mean=42.6).

- Patient related burnout was highest for dentists aged 20-29, then dentists aged 30-39, 50-59, 40-49 and 60+.

- There were numerous statistically significant associations between burnout subscales on the CBI and many factors stated in the literature including: time and scheduling pressures, staffing issues, patient perceptions and expectations, professional concerns, pressures associated with treating patients and business stressors.

- There were numerous statistically significant associations between burnout and outcomes of stress including: not fully discussing treatment options or answering questions, making treatment or medication errors, ignoring how a patient's condition may affect them socially or personally and feeling guilty about how a patient was treated.

- "Pressures associated with treating patients" was highly correlated with all CBI scales ($P < 0.01$ level).

- "Feeling guilty about how a patient was treated" was also highly correlated with patient-related burnout ($P < 0.01$ level).

- "Number of patients seen per day" was examined and subscale scores were generally highest for dentists with very low numbers of patients and very high numbers of patients.

Dentist's needs for support

Nineteen dentists (8.8%) responded "yes" to 'have you sought support to cope with stress or burnout'. Sixty dentists (27.9%) responded "yes" when asked if they require further support to manage stress or burnout.

The free-text response questions yielded some interesting comments:

- Responses to 'other causes of stress' included a range of answers including **physical pain and work-life balance**.

- Responses to 'other outcomes of stress' included issues such as **physical ailments, feeling anxious or depressed, loss of appetite, crying in front of patients, thinking about mistakes outside of work, and self-disappointment**.

- Responses to 'what support do you need?' included counselling, support groups or workshops on burnout, meditation and yoga, removing stigma around mental health, more involvement from the SDC and SDA, and removing the **"unhealthy obsession with working more than those around you"**.

Closing thoughts

In this sample of dentists, levels of reported burnout were low to moderate. However, high to severe levels of burnout were self-reported by 24 individuals (11.3%) for Personal Burnout, 17 individuals (8.0%) for Work-related Burnout, and 9 individuals (4.2%) for Patient-related Burnout. This highlights an unaddressed issue. Nonetheless, this study had several limitations including limitations around cross-sectional studies, the inventory selected, sampling, sensitivity of the subject, low response rate and changes in the outlook of professionals since the start of the global pandemic. Further research is warranted to further understand causes and implications of stress and burnout levels across various designations and working environments in Singapore.

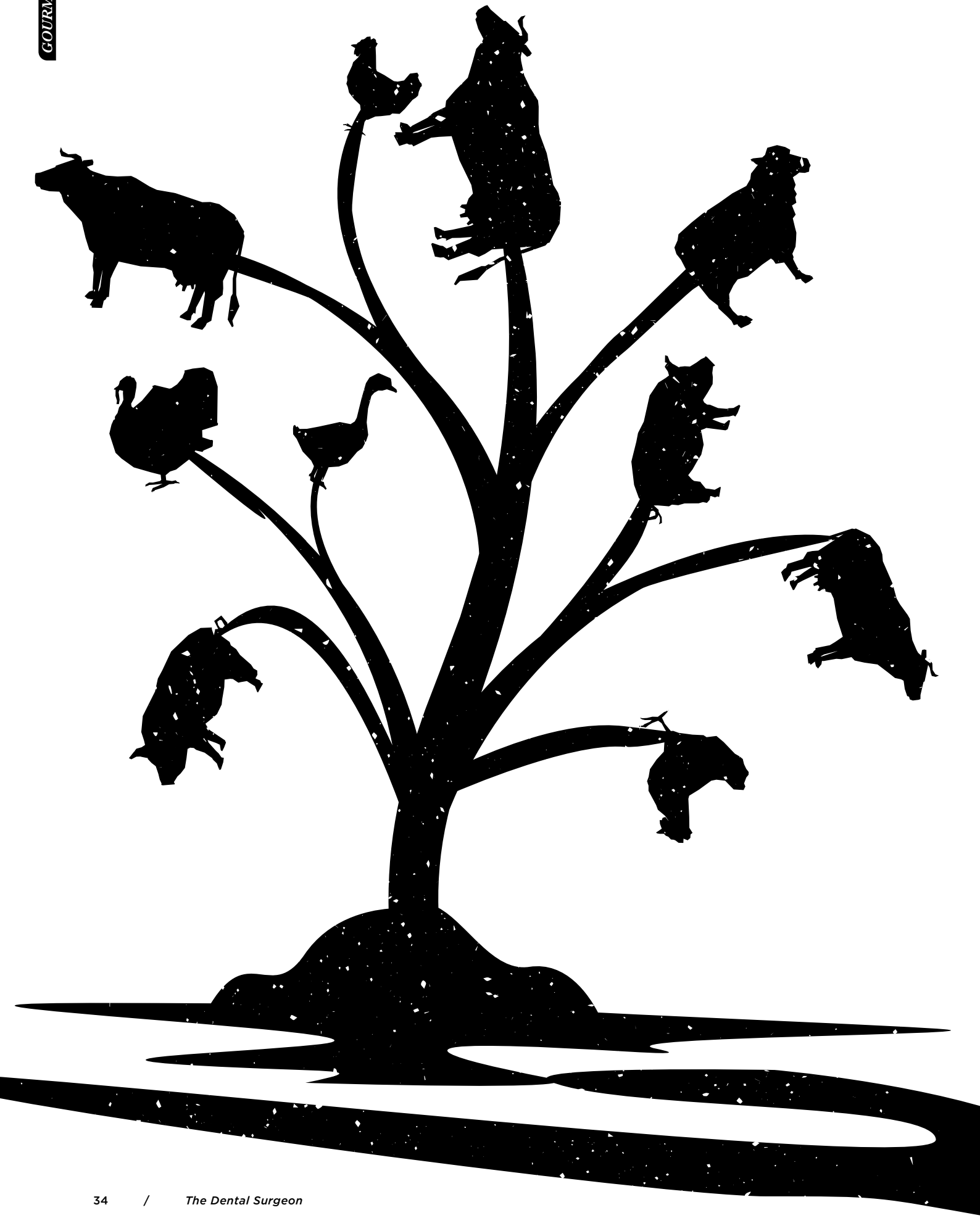
Acknowledgements

I would like to thank each one of you who reviewed and participated in this survey. Thank you to the Singapore Dental Association for supporting and disseminating the survey, Dr. Asha K. Karan for reviewing the survey, Nuffield Dental Holdings and MC Ceramics Labs for supporting the participation prize of a night in one of Singapore's 5 star hotels, Fiona Reid for assistance with statistical analysis and Dr. Alec Knight at King's College London for his support as part of my MScPH dissertation research project.

References and further details

If you would like further information about this study or are interested in reading the final publication do not hesitate to contact me on drsurinderarora@hotmail.com.

DR SURINDER ARORA *is currently based in general practice and is a holistic health and wellness junkie. She's a qualified yoga teacher and has just finished up her MScPH with her research project on dentists and burnout in Singapore. She has recently founded @dentistsofyoga to support dentists with stress and burnout through yoga and meditation.*



Three Buns – Our Journey Into Alternative Meats

The first humans made their mark two million years ago. Having a reliable source of sustenance was the difference between life and death. The earliest humans relied on foraging, only taking what was available from nature. They were an equitable part of the ecosystem, not consuming more than what was needed.

Then came agriculture. We learned that human intervention in the life cycle of plants meant a steadier supply of food. We then applied the same principles to animals; leading to the development of animal husbandry. Animals were bred for consumption of not only their meat, but for other useful products such as hide and milk.

Until the early 20th century, such practices remained environmentally sustainable. Meat consumption was a luxury for the elite while the middle and lower classes received most of their sustenance agriculturally. However, with the industrial revolution, we developed ways to dramatically bring down the costs of meat production to make it available to the masses. This, unfortunately, came at a great environmental cost.

Today, research has shown that both animals and Mother Earth have feelings. Studies have shown that repeated jumping in stilettos causes Earth to cry in the form of precipitation. Groundbreaking research in the Rwandan Medical Agricultural Journal Of Research And Things says that animals were polled as feeling 'rather uneasy' about being eaten.

With that in mind, our research team set out to explore meat alternatives available to us. The team consisted of Robert 'The Knife Nosed' Burgess, Lea 'The No Nose' Tan and Jeremy 'The Hump Nosed' Sim. Our nosy research took us to Three Buns Quayside, which offers burgers with alternative meat patties.

We conducted a test to determine if we could differentiate between real meat and their alternatives. For beef, the available alternative was the Impossible Foods beef patty. Their chicken meat alternative came in the form of a Tindle chicken patty. These alternative meats primarily use soy as the main protein source with other binding ingredients to provide texture.

The burger labels were hidden under their respective plates to keep our research unbiased.

The beef burger and the 'beef' burger were tested first. In case the patties looked significantly different, we avoided a direct line of sight with the burger. Directing food to our masticatory orifices, with only peripheral vision and proprioception, proved to be more challenging than previously perceived.

The Knife Nosed researcher took a bite from the 'beef' burger, then took another from the beef burger.

"Hmm," he said, as he took another bite of the 'beef' burger, before returning to the beef burger.

"I took another bite, and now I'm not sure," said his indecision. After a moment of deliberation he declared the 'beef' burger to be the beef burger. The beef charlatan had prevailed.

BEEF?
I NEED ANOTHER BITE
CHICKEN ???
CHOMP CHOMP CHOMP

NOSE KEY

JEREMY 'THE HUMP NOSE' SIM

ROBERT 'THE KNIFE NOSED' BURGESS

LEA 'THE NO NOSE' TAN

The Hump Nosed researcher then had a go.

"I'm pretty sure the 'beef' burger is the 'beef' burger, and the beef burger is the beef burger," I concluded.

According to my tongue, the 'beef' burger had a more fibrous texture. It was a tad chewier than regular beef. Upon visual inspection after, the 'beef' burger also had a slightly brighter red center, which bore a rather different hue to regular beef.

However, in terms of taste, the Impossible beef proved to be a fantastic alternative. Texture aside, the taste of the 'beef' was miraculously similar to the taste of the beef.

Then came the chicken vs the 'chicken'.

The No Nosed researcher first took a bite of the 'chicken' burger and said, "no, no no. This is obviously fake. It's too different. No no no."

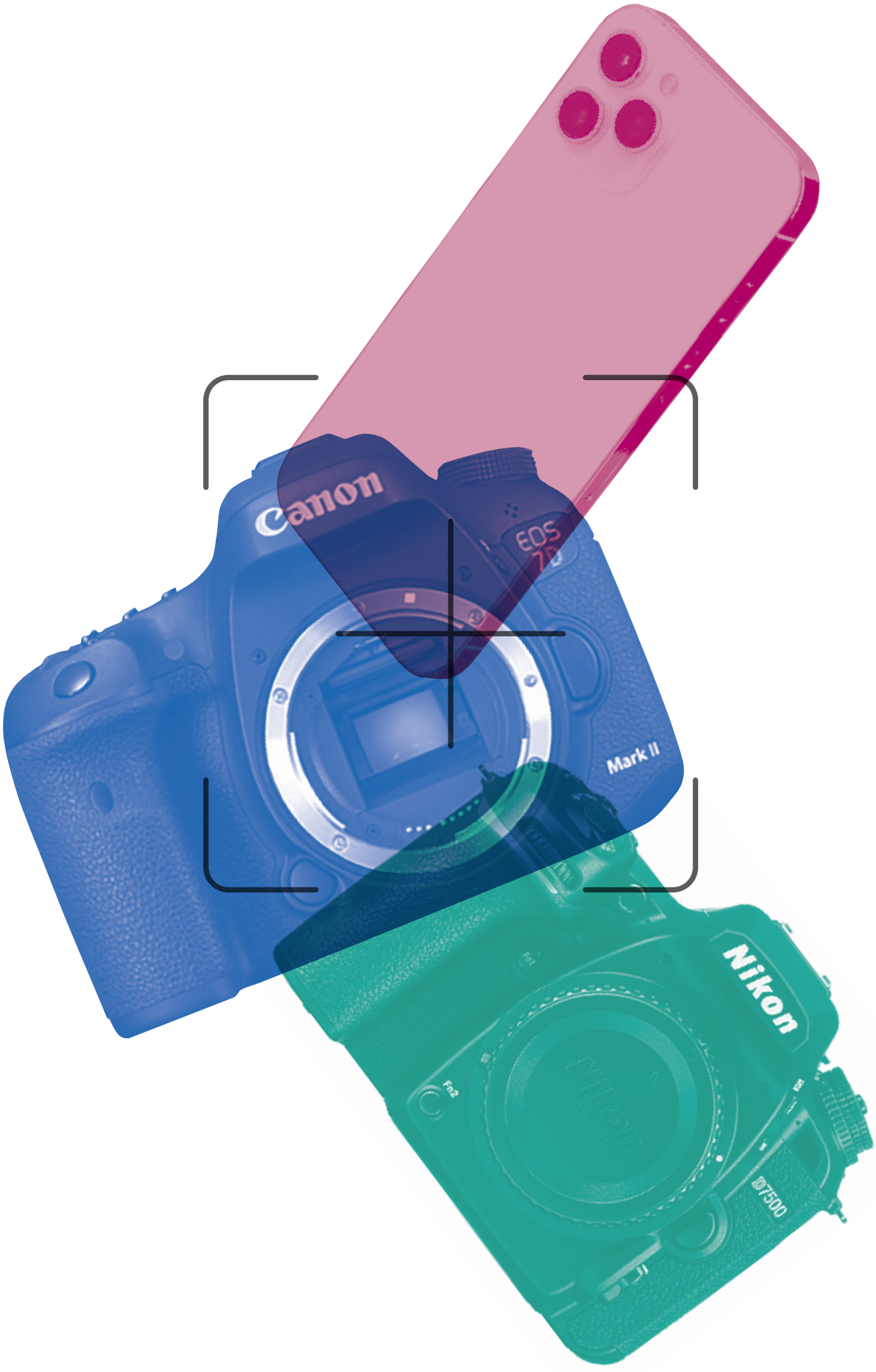
That concluded the chicken test. The alternative chicken is a far cry from its bovine counterpart— powdery, stringy and tastes like chicken as much as a pencil tastes like a brick. If Tindle chicken was to be considered to be some other food altogether, the flavour would be acceptable. However, as a chicken alternative; the regular mock vegetarian fare would be a better choice.

Both the Knife Nosed and the Hump Nosed researchers agreed with the findings of the No Nosed researcher. The Tindle chicken failed the food Turing test with aplomb.

Beef alternatives have come a long way since Dolly was cloned, when alternatives were still meh. Chicken alternatives still have a long way to go before we can be cock sure about replacing the real stuff. However, we only see beef alternatives replacing burger patties in the meantime. Replicating the texture of a slab of steak would be a challenge of its own.

Scientific disclaimer: a major confounder in our experiment was the form of the researchers' noses. We postulate that knife nosed and no nosed individuals may suffer from restricted oxygen intake, thus rendering their sense of taste to be categorically inaccurate. On the other hand, hump nosed individuals may appear as such due to a history of deformative facial trauma. This may result in sequelae such as a severe inhibition of one's mental faculties, thereby also rendering their sense of taste to be completely unreliable at best.

DR JEREMY SIM *has emerged from his bond with the government and is currently fending for himself in the real world. He currently practices as a General Dentist in Orchard Scotts Dental. He is currently seated in front of his PC trying to write about himself in the third person to no avail.*


Canon
EOS
Mark II
Nikon
D7500

TEETH THROUGH THE LENS: DENTAL CAMERA SET-UPS

All craftsmen need a portfolio.

And, as finicky craftsmen of a finicky craft whose final product needs to be captured Just Right in a way that no one but another dentist can appreciate… it comes as no surprise that dental photography set-ups can seem elaborate and daunting for a subject so small.

In this review we'll explore the world of cameras with three main considerations:

Sharpness, Accuracy and Ease of Use.

Sharpness, determined mainly by the **camera body, lens and settings**, is key to capturing and magnifying dental work in as much detail as possible.

Accuracy, influenced by **lighting and flash,** is key to conveying colour, translucency and 3D shape in a 2D medium.

Ease of use is the smallest consideration of them all, given that we routinely use the most complex instruments to get that extra little bit of asepsis or smoothness or seal. But without this, I won't get to include the mighty iPhone in this list, so…!

This review assumes understanding of basic photography and jargon such as aperture, exposure settings, focus distance etc. For those feeling a little lost, hop over to YouTube and type 'Basic Photography', there's a treasure trove of good introductions there.

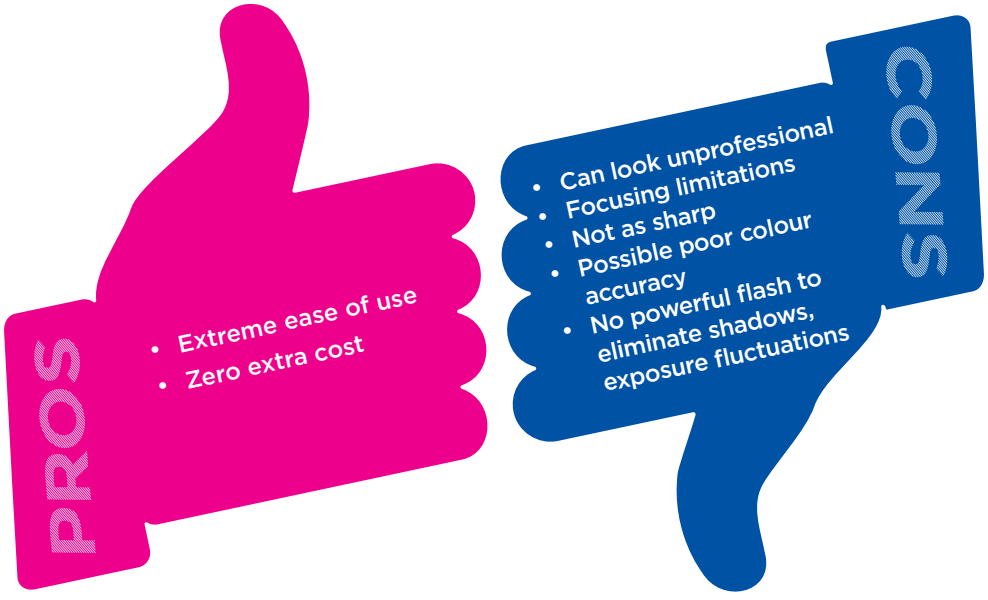
Smartphone photography

Obviously the champion in the Ease of Use category and obviously Not Prosthodontically Recommended. Firstly, there is no way to standardise exposure and colour fidelity. You'd likely be tripped up by focusing limitations and having shadows all over your region of interest.

Secondly, Patient John Doe is unlikely to return to a dentist who asks him to open his mouth and to swallow his saliva, then whips out an iPhone with a Gudetama cover and frantically clicks away.

Thirdly, you don't want to be showing Aunty Winnie a cute picture of your cat, swipe a bit too much and scare away your only audience with a smiling frontal of full-mouth root stumps. Also, PDPA.

Of course, if the intraoral camera is out of commission, or you wish to take a quick pic of an octopus of a molar you somehow extracted cleanly, or you're in the middle of surgery where everything is bone and blood and colour fidelity is the least of your concerns--by all means! Brandish that trusty iPhone Pro Max and get your picture in. It's good enough.



Point-and-Shoot cameras

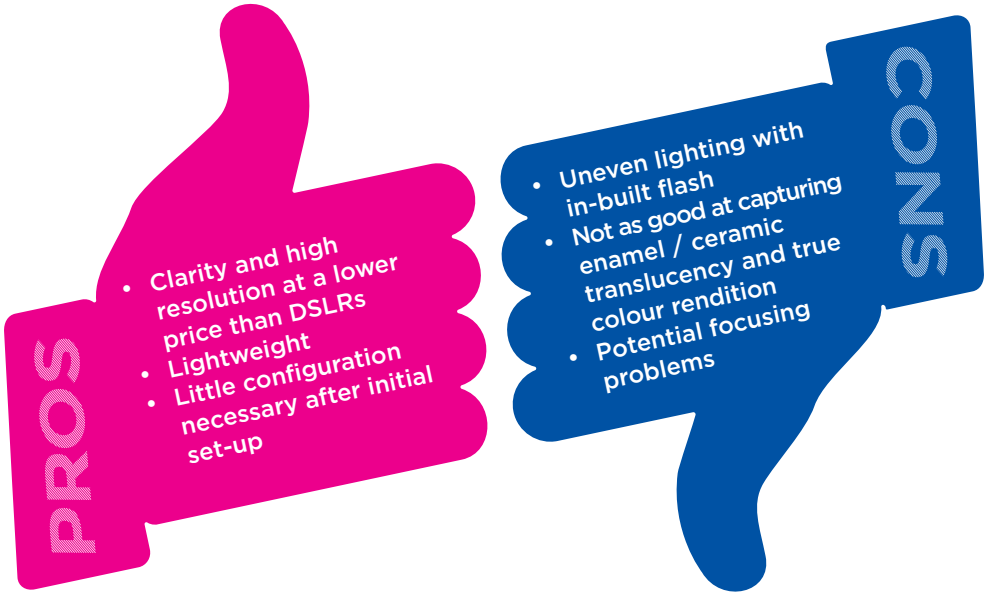
The main pitfall of these handy cameras in dental photography is the lack of customisation. Using only the in-built flash, colour rendition may not be consistent as the environmental lighting changes, and the camera will obtain focus no matter the distance of the subject. This means that ensuring the sharpness of all teeth in the intended region can be difficult at times.

Only certain models have the combination of flash placement, macro options and depth of field abilities needed for dental photography.

Dental websites stress that these cameras cannot be used 'out of the box', meaning that the camera will need a professional to apply settings suitable for a dental practice. One such service is provided by the site *https://dentalphotography.shop,* which configures the Olympus Tough TG-6 into what they term 'Clincam' especially for dentists.

Example set-up:

Canon PowerShot G7X Mark II (S$719)
Olympus Tough TG-6, configured (US$889, ~$1190)



DSLRs

Feel even more like a professional with the most expensive set-up of the lot!

Splurge on a camera body, then splurge again on a macro lens because the kit lens won't be good enough for those tiny chompers, then splurge for the (hopefully) final time on a ring light or twin flash.

Camera System

There is an endless debate over aficionados over the best camera system out there. Rule of thumb? Use what *works best for you*.

If you have a DSLR you know and love, buy a macro lens and use that to save yourself some cash. If you're starting from a blank slate, pick a brand you can see yourself sticking to, as lenses are hard to mount onto a different system.

There are many giants, such as Canon, Nikon, Fujifilm and Sony, but these seem to be the most popular in 2021 from talks with dental friends and trawling online recommendations.

Canon EOS 7D Mark II is one of the best, multi-purpose cameras around that you can bring from the clinic to your travels to even a semi-pro photography side hustle. The Nikon D7500 is a popular camera for beginners and is extremely easy to set up and use.

Lenses

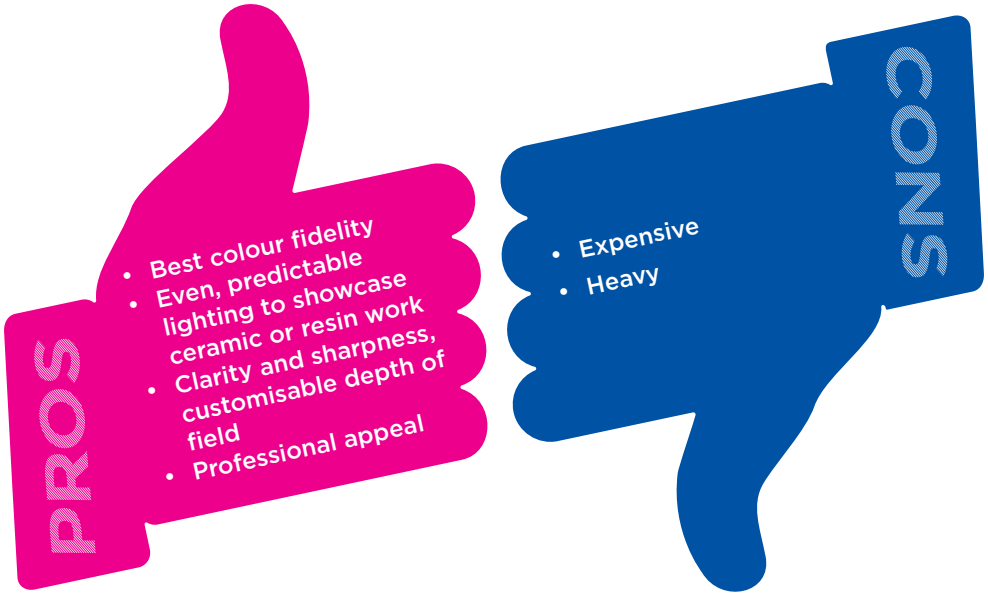
Without getting too technical, you'd need an appropriate prime (not zoom) lens for dental photography. Macro lenses allow at least 1x magnification and have short minimum focusing lengths, meaning you can get up close and personal to your patient and blow their teeth up in an image with surprising clarity.

Get a lens with a focal length between 60mm and 80mm for general purposes, and consider adding on another between 85mm and 100mm for extreme close-ups of 1 or 2 teeth.

Flash

Using just environmental lighting will be inadequate as the intensity and colour of ambient light fluctuates moment-to-moment. To ensure stable colour rendition and crisp detail on all teeth (a result of a very small aperture and lots of light), you'd need a high-quality flash, a.k.a speedlight, which gives a sufficient burst.

Macro photography is complemented by a ring flash or a twin flash. Some dental professionals prefer twin flashes as the angled light reflects wonderfully off line angles of anterior teeth, whilst others prefer the less expensive ring light that gives diffused, even lighting.



Example set-up:

Canon EOS 7D Mark II Body ($2,439)
Canon EF 100mm f/2.8L Macro IS USM Lens ($1,469)
Canon EF-S60mm f/2.8 Macro USM ($749)
Canon Macro Twin Lite MT-26EX-RT ($1,399)

Nikon D7500 Body ($1,200)
Nikon AF-S Micro-Nikkor 60mm 1:2.8G ED ($1,199)
Nissin MF18 Macro Ring Flash for Nikon (US$490, ~$660)

The Nutshell

If you're fresh with no equipment to your name and want to invest in your practice, go straight to a good DSLR.

If you're new to photography, go down to a camera store with some models in mind to test the heft and feel. Get one that is easy to configure.

If you have equipment and are looking to upgrade, invest in a good macro lens or a better flash system. Speak to colleagues and try out their systems if possible!

And lastly, in the extremes of inconvenience or where time is of the utmost essence.... a Respectable Dental Surgeon is allowed to furtively use their smartphone.

DR LEA TAN *is currently serving the second year of her bond. She dreams of traveling the world and showing off her collection of lipstick. Outside of dentistry, she has many hobbies from knitting to learning Spanish. She is happily mediocre at them all, hopefully excluding writing.*

ADVERTISING OPPORTUNITIES WITH SDA

BANNER ADVERTISEMENT
(ON SDA CARRIER SHEET)

SAMPLE INSERTION

THE DENTAL SURGEON MAGAZINE

FLYER INSERTION

EMAIL BLAST

CDE ACCREDITATION

Visit our website at http://sda.org.sg/advertising/ for more details

POLIDENT

PRO RETAINER & GUARD

PATIENT KNOWLEDGE GAPS EXIST IN CARE OF MOUTH GUARDS & RETAINERS

Help your patients establish a new routine for mouth care

OUR FIRST POLIDENT CLEANSER TESTED AND PROVEN TO BE COMPATIBLE WITH OVER 20 DIFFERENT MOUTH GUARD AND RETAINER MATERIAL[1,2]

Wire Retainers

Mouth Guards

Clear Retainers

Night Guards

CRYSTAL CLEAR TECHNOLOGY

3 Minute

Daily use

- **Effectively Kills 99.99% of germs including bacteria & viruses‡[3-5]**
- **Helps keep retainer, aligner or mouth guard transparent[1,2]**
- **Lifts stains, removes discolouration[6,7]**

‡ In laboratory tests, when used as directed

References: 1. GSK data on file, 2020, Material Compatibility Testing, Fraunhofer Institute. **2.** GSK data on file, 2020, Compatibility testing of an aligner material, Fraunhofer Institute. **3.** GSK data on file, 2011, MD#024-11. **4.** GSK data on file, 2012, MD #012-12. **5.** GSK data on file, 2011, MD#040-10. **6.** GSK data on file, 2015, CP/MVR/EDCU/09. **7.** GSK data on file, 2016, CP/MVR/EDCU/15.

For Medical & Healthcare Professionals only.

GlaxoSmithKline Pte Ltd
23 Rochester Park, Singapore 139234

For patients with mouth guards or retainers

PM-SG-POLD-21-00008