







# Editorial

By Dr David Muscat

Dear colleagues,

It has been an eventful year. The DAM has been ably led this year by Dr David Vella supported by an efficient Committee.

The DAM has organised the conference of the Council of European Dentists in Malta for the first time. This year the International Periodontology conference as well as the conference on Gerodontology were held in Malta.

At the time of writing we are looking forward to the Annual Smile for Health conference. Various dental companies as well as the ITI and Nobel study groups, the University of Malta and Ludes

Universities organise lectures and events on a regular basis.

The DAM Christmas party is to be held at the Villa Le Meridien Hotel St Julian's on Friday 8 December.

The DAM is currently involved in several issues such as Dental Clinic standards, Numerous Clausus, Dental Specialist lists; proportionality, dental technologists and advertising, amongst others and we will keep you informed and updated and if necessary call an EGM so you can voice your opinion.

The cover photo is 'St Pauls Islands' a photograph by Dr Clifford Camilleri, another of our Associations talented photographers.

To send an article to the editor please send on [editor@dam.com.mt](mailto:editor@dam.com.mt)

Best regards,

*David*

Dr David Muscat B.D.S. (LON)  
Editor / Secretary, P.R.O. D.A.M.

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## GIOVANNA ZAMMIT'S CENTURY

By Prof. George Camilleri

On 25<sup>th</sup> September 2017, Giovanna Zammit celebrated her 100th birthday. Emeritus Archbishop Paul Grech concelebrated Mass at the chapel of the Little Sisters of the Poor at Hamrun, followed by an excellent reception attended by her many friends.

She was visibly delighted by the presence of a group of dental surgeons headed by Klaus Vella Bardon. She could remember and name all of us as well as recount several episodes. Generations of staff and students at the Dental Department at St. Luke's Hospital will remember Giovanna Zammit. I was at the Department both as a student and later as head and recognised her as a reliable and driving force.

Officially a "cleaner" she actually covered a whole range of duties from keeping the department impeccably clean, maintain equipment, dental assisting to counselling. A dedicated Muzew member she was a strong stabilising force in the department. A wonderful occasion for a unique person. 🎂



Giovanna Zammit surrounded by (l to r) Tony Camilleri, Alfred Pace Balzan, Tony Charles, Klaus Vella Bardon, Archbishop Paul Grech, Sister, and George Camilleri.

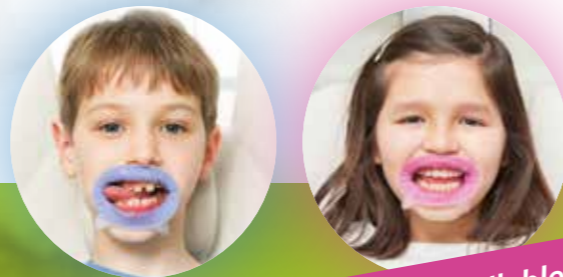
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# MEDICATION RELATED OSTEONECROSIS OF THE JAW/**MRONJ** Stephanie Sammut, Consultant in Oral Surgery

**Medication related osteonecrosis of the jaw/MRONJ**

**Stephanie Sammut**  
Consultant in Oral Surgery

**Learning Objectives**

- ❑ To understand the risk factors for MRONJ
- ❑ To review the clinical signs and symptoms of MRONJ
- ❑ To review the pathophysiology for MRONJ
- ❑ To consider management strategies for patients on anti-resorptive medications
- ❑ To review treatment options for patients with MRONJ.

**MRONJ – AAOMS Definition**

1. Exposed or necrotic bone or bone that can be probed through intra/extra oral fistula in the maxilla or mandible which lasts for more than eight weeks
2. in a patient with current/historic treatment with antiresorptive drugs
3. and no history of radiation therapy to the jaws or obvious metastatic disease to jaws

**Anti-resorptive drugs**

- ❑ Bisphosphonates: Oral and IV
- ❑ Anti-angiogenic drugs – eg bevacizumab and sunitinib
- ❑ RANK-L inhibitors - Denosumab

**Bisphosphonate Drugs**

- ❑ Used in management of metabolic and malignant bone disease
- ❑ Oral and intravenous forms
- ❑ Nitrogen/non-nitrogen containing
- ❑ Reduce bone pain, improve, quality of life and delay pathological fractures.
- ❑ Bind to hydroxyapatite in bone and remain in bone for a long time even after cessation of treatment

**Relative Potency**

Etidronate	1
Clodronate	10
Tiludronate	10
Pamidronate	100
Neridronate	100
Alendronate	100- <1000
Climadronate	100- <1000
Ibandronate	1000- <10,000
Risedronate	1000- <10,000
Zoledronate	>10,000



# MEDICATION RELATED OSTEONECROSIS OF THE JAW/**MRONJ**

Continues from page 5.

### Bisphosphonates: mechanisms of action

- Potent inhibitors of osteoclast cell activity
- Induce apoptosis of osteoclast cells
- Anti-angiogenic: anti-tumor effects
- Inhibit proliferation and migration ability of human oral keratinocytes

### Reported Side Effects

- Stomach upset (oral forms)
- Atrial fibrillation (alendronate and zoledronate)
- Atypical femur fractures
- Oral ulceration
- Osteonecrosis of the jaw

LETTERS TO THE EDITOR

FAMIDRONATE (ARELIA) AND ZOLEDRONATE (ZOMETA) INDUCED AVASCULAR NECROSIS OF THE JAWS: A GROWING EPIDEMIC.

Max, RE Pamaronate (Arelia) and zoledronate (Zometa) induced avascular necrosis of the jaws: a growing epidemic. J Oral Maxillofac Surg. 2003 Sep;61(9):1115-7.

### RANK-L inhibitors : Denosumab

- Humanised monoclonal antibody
- Inhibits osteoclast formation function and survival
- Binds to RANKL (cytokine) and prevents it from binding to the RANK receptor on osteoclasts
- Administered subcutaneously
- Used for osteoporosis ( every 6 months) and in metastatic disease (every month)
- Does not bind to bone – effects on bone turnover cease after 6-9 months

### Anti-angiogenic drugs

- Inhibit formation of new blood vessels
- Used in cancer treatment to restrict tumor vascularisation and growth
- Often used in combination with bisphosphonate drugs
- MRONJ risk higher when used in combination

### MRONJ: Clinical Presentation

- Exposed bone
- Asymptomatic
- Pain
- Suppuration
- Sequestrae
- Swelling
- Non healing extraction site
- Paraesthesia
- Intra/Extra-oral draining sinuses

### Clinical presentation

- Occurs most commonly in mandible
  - 65% mandible
  - 28.4% maxilla
- Spontaneous
- Following extraction
- Trauma from dentures
- More prevalent in areas with thin overlying mucosa eg. tori, exostoses, and the mylohyoid ridge

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Continues on page 9.

# Help keep your patients on a journey to healthy gums



At least

**50%** of adults suffer from gingivitis globally,<sup>1</sup> but **2 out of 3** take no action<sup>2</sup>

## Periodontal disease impacts daily life

Patient insight research shows that gingivitis can have a negative impact on daily life causing anxiety, embarrassment and affecting social life, especially when symptoms become noticeable to others.<sup>3</sup>

**parodontax® toothpaste helps to free patients from the wider effects of gingivitis.<sup>3</sup>**

After 30 days, patients reported:

**Less anxiety**  
2 out of 3 patients no longer worried about their gum health<sup>4</sup>

**Better social life**  
2 out of 3 patients no longer avoided social situations<sup>4</sup>

**Greater confidence**  
2 out of 3 patients were more confident<sup>4</sup>

## Treat and Maintain

In addition to good oral hygiene and professional advice, patients with, or susceptible to gingivitis may benefit from the addition of **parodontax®** for their optimum gum health.<sup>5,6</sup>

**4X** greater plaque removal\*<sup>7</sup>      **48%** greater reduction in bleeding gums\*<sup>7</sup>

**Recommend parodontax® toothpaste to help patients maintain their optimal gum health between dental visits**



Healthy gums

# MEDICATION RELATED OSTEONECROSIS OF THE JAW/MRONJ

Continues from page 7.

## Staging (AAOMS)

**At risk:** any patient on antiresorptive meds

**Stage 0:** sub-clinical, non specific symptoms, radiographic changes

**Stage 1:** exposed necrotic bone : asymptomatic no evidence of infection

**Stage 2:** exposed necrotic bone with pain and clinical evidence of infection

**Stage 3:** Painful widespread exposed necrotic bone extending beyond alveolar bone +/- pathologic fracture, extra-oral fistula/OAF.

## MRONJ: Radiographic Appearance

Narrowed PDL  
Widened lamina dura  
Osteolysis  
Osteosclerosis  
Non healing sockets  
Sequestrae

## Incidence - MRONJ

- Minority of bisphosphonate users develop MRONJ
- Cancer>Osteoporosis
- Under-recognised/under-reported
- Wide variation across the globe

## MRONJ in Osteoporosis

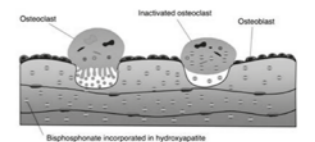
- Merck Whitehouse Station ( manufacturers of Fosamax) 1.6-3.8 cases/100,000 DPYs
- UK:
  - BAOMS/RCS estimate 620 new cases per year
  - 1:100,000 in general population
  - 1:1000-1:10000 in post-menopausal women exposed to oral BPs
- Denosumab:
  - Figures from Amgen : 13 cases of MRONJ were observed in 4450 patients (0.3%) over seven years of an extended phase III clinical study

## Incidence of MRONJ in cancer

- BPs:
    - Range of estimates: 0-12% (0-1200 cases per 10,000)
    - Small sample sizes
    - Larger sample sizes: 0-2.3% ~ 1%
  - Denosumab:
    - Comparable to zoledronate IV
    - Meta-analysis of 7 RCTs – 1.7%
- Q1 W1. Risk of osteonecrosis of the jaw in cancer patients receiving denosumab: a meta-analysis of seven randomized controlled trials. *Int J Clin Oncol*. 2014 Apr;19(2):493-10. doi: 10.1007/s12032-013-0561-4. Epub 2013 Apr 20.
- Antiangiogenic drugs
    - 0.2% (0-20 cases per 10,000)
    - Increased incidence when antiangiogenics used in conjunction with anti-resorptive drugs

## Why the jaw?

- Oral cavity : unique environment
- Jaws - high rate of bone turnover -drug targets sites of skeletal metabolism: degree of skeletal uptake is dependent upon the rate of bone turnover.
- Jaws have a terminal circulation



\*Compared to a regular toothpaste following a professional clean and 24 weeks' twice-daily brushing.  
References: 1. CDC Perio 2016; Half of American Adults have Periodontal disease. 2. Data on file, GSK, parodontax® Segmentation, August 2015. 3. Data on file, GSK, Firefish: Putting the patient first. Life impact of gum disease, March 2016. 4. Data on file, GSK, Taste Adoption study (n=600), Italy 2016. 5. Kakar A, et al. Evaluate the Efficacy of Different Concentrations of Sodium Bicarbonate Toothpastes. IADR General Session and Exhibition, Cape Town, South Africa, 2014. Abstract No: 754. 6. Data on file, GSK, RH01530, January 2013. 7. Data on file, GSK, RH02434, January 2015.  
Prepared November 2017. CHMLT/CHPD/0002/17

Continues on page 10.

# MEDICATION RELATED OSTEONECROSIS OF THE JAW/MRONJ


Continues from page 9.

## Prevention

- Prevent dental disease/ Education
- Consider alternative dental therapy
- Chlorhexidine mouthwash
- Prophylactic antibiotics : no evidence
- Drug holiday – Denosumab
- "Atraumatic" surgery

## Risk Assessment

- Environmental Factors**
  - Reason for therapy
  - Duration of therapy
  - Relative potency of drug
  - Other concurrent medication
    - Steroids
    - Antiangiogenics + BPs
  - Dentoalveolar surgery
  - Patient factors: age, diabetes, obesity etc



## Patients on established anti-resorptive regime

<b>HIGH RISK</b> <ul style="list-style-type: none"> <li>Cancer patients</li> <li>Treatment of Osteoporosis with oral or IV BPs for more than 5 years</li> <li>Treatment of Osteoporosis with oral or IV BPs OR denosumab for any length of time but with concomitant steroid therapy</li> <li>Previously diagnosed with MRONJ</li> </ul>	<b>LOW RISK</b> <ul style="list-style-type: none"> <li>Treatment of Osteoporosis with oral or IV BPs for less than 5 years and with no concomitant steroid therapy</li> <li>Treatment of osteoporosis with denosumab</li> </ul>
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## Duration of drug therapy

- Drug holiday
  - Drugs persist in skeletal tissue for years
  - No evidence that risk of MRONJ will be reduced
- Previous treatment with anti-resorptive/antiangiogenic drugs
  - Bisphosphonates remain in the body
  - Allocate patients to risk group as if they are still taking drugs
  - Denosumab – 9 months

## Dentoalveolar surgery

- 'procedures which impact on bone'
- 60% of MRONJ cases follow an extraction
  - However MRONJ can be spontaneous
  - Or be the result of mucosal trauma
- Incidence of MRONJ following extractions
  - 2.9% in cancer patients
  - 0.15% in osteoporosis patients
- Implants ?!!

## Initial management of patients at risk of MRONJ


- Don't be afraid to treat these patients!
- Ideally assess patients BEFORE they start drug therapy
- Prevention
- Get patient as dentally fit as feasible

## Prevention

- Education – small risk of MRONJ
- Preventative advice
  - Healthy diet – reduce sugar intake
  - Excellent oral hygiene
  - Fluoride toothpaste/mouthwash
  - Stop smoking
  - Limit alcohol intake
  - Regular visits to dentist
  - Seek help early if – loose teeth, exposed bone, pus, paraesthesia etc.

## Risk Assessment

- Genetic Markers**
- Biochemical turnover markers**



## Biomarkers: C-Terminal telopeptide (CTX)

- Breakdown product of collagen Type I
- Considered a surrogate marker of bone turnover.
- CTX level in the blood serum is proportional to the degree of osteoclastic resorption.
- Level of morning fasting serum CTX : risk indicator of developing BRONJ?
- CTX Values:
  - healthy patient : between 300 and 550 pg/ml.
  - Increased risk BRONJ : below 150pg/ml.
- CTX values improve following a 6-month drug holiday.

## Management of patients on antiresorptive therapy

- Patients about to start/recently started anti-resorptive therapy:
  - Prevention
  - Education
  - OH advice
  - Stabilise oral health – scaling, restorations, endo
  - Extract any teeth of hopeless prognosis without delay

## Patients on established anti-resorptive regime

<b>HIGH RISK</b> <ul style="list-style-type: none"> <li>Does the tooth really need to come out?</li> <li>Can I save it? Endo? Root stump?</li> <li>Extract if required</li> </ul>	<b>LOW RISK</b> <ul style="list-style-type: none"> <li>Treat like a patient who is not on antiresorptive therapy</li> <li>Consider timing of extractions?</li> </ul>
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Continues on page 12.



# MEDICATION RELATED OSTEONECROSIS OF THE JAW/MRONJ

Continues from page 11.

**Management of MRONJ**

- Consider referral to Oral Surgery/Special care for those patients:
  - Who are medically complex
  - Where treatment plan may be challenging
  - Who require surgical extractions which would not usually be undertaken in practice
  - Higher risk cancer patients on both antiangiogenic and antiresorptive drugs

**Management of MRONJ**

- EXCLUDE MALIGNANCY!!!
- no universally accepted treatment protocols
- Consider:
  - age,
  - sex,
  - disease status (osteoporosis vs Malignancy)
  - ONJ stage and lesion size
  - medication exposure
  - medical and pharmacological comorbidities
  - life expectancy
  - quality of life

**Management of MRONJ**

- Conservative:
  - Irrigation/mouthwash
  - Antibiotics – Penicillin, doxycycline, clindamycin, metronidazole
  - Long term vs short term Abs (Hoefert, 2011 JOMS)
  - Teriparatide - anabolic effect
    - contraindicated in cancer patients/ h/o radiotherapy.
- Surgical:
  - Sequestrectomy/ debridement +PDGF?
  - Resection +/- reconstruction
  - Intra-operative fluorescence guidance

J Oral Maxillofac Surg. 2015 Dec;73(12 Suppl):S94-S100. doi: 10.1016/j.joms.2015.09.024 Disease Stage and Mode of Therapy Are Important Determinants of Treatment Outcomes for Medication-Related Osteonecrosis of the Jaw. Sugiura S, Li, Kohji H.

**Management of MRONJ**

- Alternative:
  - Hyperbaric oxygen
  - Ozone
  - Laser
  - Autologous stem cell intraliesional transplantation
  - Pentoxifylline and tocopherol

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# THE SMART BONE 2 DAY COURSE IBI

Organised by Page Technology at the Radisson St Julian's on Friday 10 and Saturday 11 November, 2017.

Lecture on Periodontology by Professor Giorgio Carusi, Specialist in Odontostomatology.  
Summarised by Dr David Muscat.

## TREATMENT OF SOFT TISSUES

The design and thickness of the flap is very important. How can one increase keratinised tissue to maintain a healthy flap during the healing process after a bone graft? You must decrease tension of the flap.

Do not touch the surface of the root and do not touch the subcrestal fibres if you do not have a perio problem. If you put the flap back in the original place you will get a long junctional epithelium. Cells will move along the wall of the flap until the position of the cementum. This is not a reattachment but a migration of epithelium. The epithelium needs vascularisation from the connective tissue flap. The name is wrong as it is not an attachment but an adhesion which can be opened like a zip by gram negative bacteria.

## THICKNESS OF THE FLAP

### 1. Total Thickness Flap-*muco- periosteal*

A blade enters into the marginal sulcus, leaning on the bone crest and by an elevator we denude completely the bone surface. When we detach the periosteum from the bone, the periosteum loses its attachment for 12-14 days with the interruption of its vascularisation.

### 2. Partial Thickness Flap-*muco*

Keep the periosteum and the part of the connective tissue on bone. We do not remove the cortical surface, with less resorption of bone. For the design we must keep the blade parallel to the bone surface. It is a more difficult procedure. There is a relaxing mesial incision.

To avoid a perforation of the flap at the level of the muco-gingival line from mucosa to keratinised gingiva. If you cut from keratinised gingival to mucosa you



can perforate. You will cut muscle and elastic fibres. To move the flap you have to remove these fibres. If you go over the mucogingival line by 4-5 mm you can move the flap by 10mm. If you do a total thickness flap you can move 1mm.

It is important to move the flap without tension. If you leave tension, the flap opens and epithelium migrates along the wall of the flap- you get exposure of the flap, necrosis and failure.

## RESORPTION

There is a relationship between the amount of connective tissue above the alveolar process and bone resorption. If you have thick

connective tissue over bone we have resorption on the periosteal side. If we have thin connective tissue you have resorption on both the periosteal and periodontal side.

This is due to the thickness of the connective tissue. With thin tissue the resorption is large.

With a total thickness flap with 5 mm radicular bone exposition and apically repositioned flap of 5mm -you will get after 6-10 days resorption of bone of 5mm. after 5-6 months you will get a loss of 2.5mm bone.

Continues on page 16.



# THE SMART BONE 2 DAY COURSE IBI

Continues from page 15.

With a partial thickness flap and 5mm of bone exposed and a flap apically, after 10 days you get 1.9mm of bone loss. After 3-6 months you get 1.3mm of bone loss. (studies at Boston university 1974).

## THE DOUBLE THICKNESS PALATAL FLAP

The detachment of a partial thickness flap (primary flap) that will be positioned again and of a connective periodontal flap.

The incision of the primary partial thickness flap is exactly at probing depth. Reduction of the tissue step due to the thickness of the palatomucosa. Some dentists carry out a gingivectomy to completely remove the pocket.

If you have a step by doing a gingivectomy there will be a large accumulation of bacterial plaque. The secondary flap is detached and taken away. This is connective tissue and can be used for the implant without a second operation.

## THE BIOLOGICAL PROCESS OF HEALING

Biological principles are very important. Pay attention to the area between the first and third molar area where one finds the greater palatine artery. This is 15mm from the midline raphe.

The average palate-safe distance from CEJ is 12mm. In a shallow palate safe distance is 7mm. In a high palate distance 17mm.

## BLADES USED

A beaver knife no. 64 or 67.  
A round knife. Very small-three times smaller than average and the operator uses magnification.

It is preferable to eliminate the LJE completely if one gets recurrent perio abscesses as there is immigration to the base of the flap. If there is a low degree of perio disease one may prefer to maintain LJE but the patient must have good OH.



## POSITIONING OF THE FLAP

Do not remove supracrestal fibres on the buccal aspect. If these fibres are good you can put the flap back in its original position but use a double thickness flap. The palatal flap will be placed at the level of the bone crest so will thus be at a different level than the buccal aspect.

When the attachment apparatus is present one gets reattachment. When the attachment apparatus is not present you get a long junctional epithelium.

## ORTHODONTIC TREATMENT WITH PERIODONTAL PATIENTS ONLY USE 20G OF FORCE.

**STRONG FORCES MAY EXTRACT TEETH.**  
One needs to allow time for the periodontal ligament to absorb hyalination.

## SUPRACRESTAL FIBRES

It is a mistake to remove supracrestal fibres with root planning. There is no probing depth. With a partial thickness flap you maintain supracrestal fibres. With a full thickness flap you remove supracrestal fibres.

## THE APICALLY POSITIONED FLAP

You will get an exposition of the roots, hypersensitivity, caries and lengthening of the crown and recurrent periodontal disease. Hypersensitivity is the main problem and can be treated with MI varnish. A shallow sulcus is a result of an apically positioned flap. Supracrestal

fibres have a small epithelial attachment. One uses a subperiosteal suture to keep the flap in position.

The limitations are that there is not sufficient width of connective tissue bed. The advantage is a stable maintenance of the flap position. Materials – a half circle round section needle with a 5(nI) thread.

## THE SUB PERIOSTEAL SUTURE

With the needle we penetrate the buccal flap 3-4 mm from the gingival margin and then go subperiosteal by piercing the periosteum 3-4 mm from the bone crest, thus stabilising the flap exactly at the bone crest completely eliminating the pocket. you get a shallow sulcus but not a long junctional epithelium.

Keep the knife parallel to the bone surface. Osteoplasty is carried out with a diamond drill. A palatal cross suture is good for a strong adhesion of the flap to the bone plane. ORTHO- stabilise teeth with passive stabilisation.

## BULLAEMIA

These patients induce vomiting and destroy their teeth. What is typical is a girl who has a conflict with her mother. Use an apically positioned flap of a partial thickness variety. Keep at the level of the crest.  
Reconstruct teeth with composite and use ceramic at a later stage.

## HOW DO WE OBTAIN NEW ATTACHMENT

JClin Perio 1980. Karry Nyman Lindhe

'Healing following implantation of periodontally affected roots into the bone tissue'.

The conclusion of the study was 'When there is periodontal disease only the migration of epithelial cells can save the root from resorption.'

Later studies showed that when you get new cementum, you get new attachment, and this was proven as Sharpeys fibres were seen on microscopy. ■

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<sup>1</sup>Defined as non-antibacterial fluoride toothpaste.

References: 1. Fine DH, Sreenivasan PK, McKiernan M, et al. *J Clin Periodontol.* 2012;39:1056-1064. 2. Collins LMC, Dawes C. *J Dent Res.* 1987;66:1300-1302.

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## ENDODONTIC TIPS

When filing one should go in three times with each file and irrigate. If you block the apical third it will take long to unblock it. The system comes with three files Green, Yellow and Red. Small and Large sizes.

The green takes the longest time to reach working length as it is making the taper. Yellow has a small taper so it goes down quickly to the apical third. For optimal function 500 rpm is used (as opposed to Protaper which uses 300 rpm). You use 400g or 3N settings for these files. You must press the pedal before entering the root canal and take foot off the pedal after you are out as otherwise it will block. Maximum 3 entries.

## DO

1. TF and TTA ADAPTIVE MOTION
2. Always press the foot pedal before entering root canal
3. Max 3 entries
4. Irrigate after every 3 entries

## DON'T

1. USE EDTA with this system
2. Stop foot pedal while file engaged in root canal
3. Use rotary file without rotation in root canal

## SODIUM HYPOCHLORITE

- Should be used for 40 minutes.
- 1920
- 0.5-6% depending on country
- Organic part of debris

- Decreasing concentration will decrease toxicity but also antibacterial effect.

If you dilute you have to use for longer. It does not destroy all bacteria and it has an unpleasant smell. If you heat it, it becomes more active but it is impossible to heat and maintain the temperature inside. Also heating it makes it more toxic.

Hazards-allergy; goes beyond an open apex; getting into the bloodstream if you inject under pressure. Blood circulates at 3-8mmHg. What is above 6mmHg is problem- this is possible as some systems are used under pressure. One may also use a negative pressure. If one has an accident with sodium hypochlorite, one must wash with saline. Use painkillers; prednisolone 125mg; use cold water compress (not ice) and antibiotics Augmentin 1g every 12 hours.

## CHLORHEXIDINE

- Use for 1 minute (no studies to prove this is ideal time)
- Less toxic; large spectrum; less cytotoxic; only one which kills the Enterococcus Faecalis (in non vital teeth) In vital teeth you do not have to use chlorhexidine.

## EDTA

- 17%
- Prolonged exposure can cause excess removal of dentine. It removes the inorganic parts of the smear layer. It has little if at all antibacterial effect.

If EDTA and Hypochlorite mix you will get effervescence-these bubbles will cause a blockage in the lateral canals and dentinal tubules. If you wish you use EDTA you need to wash away the hypochlorite first with distilled water.

## CITRIC ACID

This needs oxygen to work so will not work at apical third-only will work in coronal part.

## IRRIGATION REQUIREMENTS

- Irrigate through the canal.
- Creation of a current.
- Removal of irrigant and debris

## PROBLEMS

The irrigant may not reach the apex due to surface tension of the liquid. Rinsing with negative pressure is safer. One needs aspiration inside the canal. The ENDOVAC allows one to safely deliver an abundance of sodium hypochlorite to the full working length. In addition one is using fresh irrigant all the time.

The Endovac Pure injects and removes NaOCl. There is a microcanula in it which has 4 holes. The tube has a diameter of 0.32. It is impossible to go beyond the apex as the liquid is connected to the suction all the time with apical negative pressure. The instrument can also be used to drain pus from the periapical area. It has a cap which goes over it like a crown. One can select a low speed or a high speed. 1.5 mins per root canal is enough as this is very efficient. One can use it after one reaches a working length with a size 35. It also dries the canal out so you do not need to use paper points.

## OBTURATION

- Single
- Lateral
- Thermafil (Carrier Based Condensation)
- Obtura (Vertical Warm Condensation)
- System B (Continuous Wave Of Condensation)
- Thermafil - this is difficult to remove as it has a plastic in it and is used for the core. It is a problem if one has to retreat. Also because of the heat the patient feels pain. It is also expensive.
- Lateral Condensation - time consuming; expensive; can create voids; more cones; one needs to push more which can lead to a fracture. One must note that all gp points are hand rolled so there is a possibility of human error and

Lecture and hands-on course presented by Dr Anca Maria Badescu. Organised by Page Technology and Kavo Kerr Professional Education in conjunction with the Dental Association of Malta at the Hilton Malta. Summarised by Dr David Muscat.

the length advertised may not be correct. One must always check the length and if too long one may use the TIPSNIP which is a GP point cutter.

## SEALANTS

ZNO/EUGENOL and calcium hydroxide have a long history of success.

Zinc Oxide eugenol has a powder base with a liquid catalyst. non toxic and non irritant and has a high radiopacity. The working time is 1-4 hours or 6-8 hours-two types. The setting time is less than 2 hours.

## THE ELEMENTS FREE DEVICE

Before using this one needs to prefit the plugger into the canal. Then leave 1 mm shorter than the apex. Use the TIPSNIP for this.

The reason for this is that when you pack with heat and pressure it will go down a bit more and fir perfectly. If you have a 004 taper then use an 04 plugger -or else one size up to 06.

The plugger is heated to 200 degrees and then placed in to melt the gp so that it can enter the lateral canals.

First go to working length minus 4-5 mms - so there is a new working length for the heat plugger. Place the gp 3 to 4 mms into the sealer and place in the root canal. Then use the heat plugger.- go through the middle of it. Condense and close the gaps. Melt the gp and then stay on it for 10 seconds. The last step inject the gp.

This excess will be easy to remove so one can place a post.

The first part uses System B - after 4 seconds of heat the heat is switched off automatically as a safety feature.

A sound is emitted. The screen also displays the temperature. The device can also be used to cauterize gingivae. 📺





# DATA GATHERING: A PREREQUISITE FOR TREATMENT PLANNING IN IMPLANTOLOGY

By Dr. Dennis Cutajar BChd MSc

## ABSTRACT:

*In this day and age, it is no longer acceptable to simply treat individual teeth in a technically proficient manner. Patients are giving increasing importance to their general appearance, and expect to receive a high level of oral care, which is physiologically and mechanically sound, and also aesthetic. (F.M. Spear, 2007) It is up to the clinician to discuss and decipher what the patient expectations are, if they are realistic and achievable, and whether or not he or she is technically proficient to plan or provide the necessary therapy. (R.E. Goldstein, 1984) This text aims to provide a concise overview of the data gathering phase required for restorative driven treatment planning, in order to achieve predictable, functional and aesthetic outcomes in implantology. It is beyond the scope of this paper to give a detailed explanation of each and every procedure that could potentially be involved in the clinical examination. Only the salient points will be discussed, with an emphasis on those more pertinent to the restorative clinician.*

## CLINICAL RELEVANCE:

The importance of adequate restoration-driven treatment planning for implant placement may be readily found in the literature and cannot be understated. Even when a multidisciplinary team is available, perhaps consisting of a multitude of specialists, dental technologists, radiographer, oral surgeon and restorative dentist, it is the latter who is often the first and final point of contact for the patient. Wood and Vermilyea have implied that the dentist restoring the implants, after coordinating the required consultations with appropriate specialists, should be responsible for the treatment planning. (M.R. Wood, 2004) Following stringent, evidence-based therapeutic pathways, allows clinicians to be thorough and predictable in their treatment planning, and more analytical of their work once this is completed.

## THE TREATMENT PATHWAY

*Aschheim, 2015*

- **Step 1:** Diagnosis and treatment planning
- **Step 2:** Placement of the implant
- **Step 3:** Provisional restoration
- **Step 4:** Impressions for definitive restoration
- **Step 5:** Insertion of definitive restoration
- **Step 6:** Maintenance

The data-gathering phase is essentially a prerequisite for each one of these steps.

## PRESENTING COMPLAINT AND ITS HISTORY

The patient's presenting complaint may enable the clinician to decide on whether or not the patient's expectations are realistic. This may be pursued with a mixture of simple open and closed questions such as:

- Are you happy with the appearance of your teeth?
- If no, what would you change to improve it?
- Would you rather have white, perfectly aligned teeth or natural looking teeth with slight imperfections? (J.R. Calamia, 2011)

## MEDICAL, DENTAL AND SOCIAL HISTORY

Pertinent data gathering is normally initiated by taking a detailed history in a logical, systematic manner, which enables clinicians to minimize the risk of missing out vital information. This may influence the quality of the overall care provided for the patient. (Greenwood, 2015) Absolute and relative contraindications need to be carefully assessed and discussed with the patient.

## SMOKING

The negative impact of smoking on implant success has been well documented in the literature. Patients should be well aware of this risk prior to consenting for implant treatment. (D. Hinode, 2006)

## DIABETES MELLITUS

Diabetes mellitus, a metabolic disorder, has the potential to negatively affect the patient's ability to heal and resist infections. Patients with uncontrolled

diabetes are thought to be moderately more susceptible to late implant failure, due to a reduction in tissue turnover and impaired tissue perfusion. (Michael G. Newman, 2014)

## METABOLIC BONE DISORDERS

Osteoporosis is a skeletal disorder in which there is decreased mineral density. There is conflicting evidence in the literature regarding implant success, and clinicians may be prudent to allow for longer healing times prior to implant loading. (B. Friberg, 2001)

## CORTICOSTEROIDS

Chronic use places patient at a greater risk for secondary adrenal insufficiency, especially during lengthy, stressful procedures. (J.W. Little, 2008)

## BISPHOSPHONATES

IV bisphosphonate therapy is considered to be a greater risk than oral therapy. However caution should always be exercised especially in patients with a history of more than three years of use. (Assael, 2009)

## RADIATION THERAPY

Radiation therapy as a highly significant risk factor in implant therapy, especially when patients have received doses greater than 60Gy. Literature regarding the benefit of using hyperbaric oxygen therapy to reduce the risk of osteoradionecrosis is still inconclusive. There are reports implying significant improvements in implant survival rates. (G. Granstrom, 1999)

However a more recent systematic review concluded that evidence is still lacking. (P. Coulthard, 2003)

Psychologic and mental conditions Psychiatric syndromes such as schizophrenia and paranoia, patients with mental instability, irrational fear, phobias and unrealistic expectations may be considered to be cases in which implant therapy is an absolute contraindication. (Michael G. Newman, 2014)

## ALCOHOL CONSUMPTION

Excessive alcohol consumption may be associated with bleeding tendencies, unpredictable metabolism of certain medications and a greater risk of infection spread. (J.W. Little, 2008) A recent study showed that increased alcohol intake had a negative influence on osseointegration in rats. (C.P.de Deco, 2015)

## THE CLINICAL EXAMINATION

Clinical examination of any patient should include teeth, periodontium and the articulatory system. (S.J. Davies, 2008b)

However the general dental examination should start as soon as a patient walks into the treatment area. Care should be taken to note the patient's gait and general body symmetry, their ability to speak coherently and maintain eye contact, their complexion, signs of pallor, yellowness or excessive redness or cyanosis, undue breathlessness or sweating, all of which may provoke suspicion regarding potential underlying medical issues. (Bain, 2003)

## SOFT TISSUE EXAMINATION

This should be carried out at every appointment. Lesions should be meticulously recorded with reference

to their site, size, shape, color and texture. Intra-oral photography is useful as a visual baseline record for future comparison. (FGDP, 2009)

## TOOTH EXAMINATION

Following the examination of teeth, the clinician should have a clear record of which teeth are missing, and ideally why they had been lost. Primary and secondary caries lesions, existing restorations and non-carious tooth surface loss should be recorded together with their prognosis. Evidence of misaligned teeth, over-eruption, tipping and drifting may warrant orthodontic referral prior to implant placement. (Bain, 2003)

## PROSTHETIC EVALUATION

Existing prostheses may be examined for deficiencies in function and aesthetics. (FGDP, 2009) Patient input on existing prostheses may prove to be invaluable to gauge patient expectations. A current online tool of note is the SAC assessment tool, which enables clinicians to reflect on normative guidelines, regarding both restorative and surgical cases, formulated by the ITI at a Consensus Conference in 2007. (U. Belser, 2009)

## PERIODONTAL EXAMINATION

This is normally initiated with a basic periodontal examination, and followed by a more thorough examination if warranted, allowing the clinician to record details on probing depth, evidence of bleeding on probing and recession, tooth mobility and fremitus. (I.L.C. Chapple, 2002)

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## GINGIVAL BIOTYPE

Two main gingival biotypes have been described, the thin scalloped and the thick flat periodontal biotypes. (W. Becker, 1997)

About 15% of individuals present with a thin gingival biotype, typically characterized by a reduced quality and quantity of keratinized mucosa, a scalloped underlying osseous form covered with overlying delicate soft tissue. These individuals exhibit a tendency for more resorption following tooth extraction or implant placement than those with a thicker gingival biotype. The latter have thick, dense bone with overlying thick flat soft tissues, which typically react to aggression with scar formation, which may be detrimental to both function and aesthetics. (Aschheim, 2015)

## KERATINIZED VERSUS NON-KERATINIZED GINGIVAE

Literature regarding the importance of keratinized gingivae is currently rather inconclusive. Some studies indicate that coated implants have a greater risk of bone loss and failure if surrounded by non-keratinised tissue. (M.S. Block, 1996) Others imply that if oral hygiene is favorable, the lack of keratinized tissue is not a detrimental factor towards implant success. (J.L. Wennstrom, 1994)

## OSSEOPERCEPTION AND OCCLUSAL CONSIDERATIONS

Osseoperception may be defined as mechanoreception in the absence of periodontal mechanoreceptors. It is derived from mechanoreceptors in muscles, TMJ, periosteum and mucosa. It has been shown to improve tactile discrimination and motor function in patients with implant-supported prostheses, when compared to full denture wearers. However, it is also

evident that it is still significantly less than that in dentate individuals. (I.Klineberg, 1999)

This reduction in tactile perception arguably results in unfavorable protective reflexes. This is compounded by the fact that implants have an inferior surrounding blood supply when compared to teeth, rendering them less capable of reacting to noxious stimuli, including occlusal overload. (S.J. Davies, 2002)

## OCCLUSAL TREATMENT PLANNING: THE EDEC PRINCIPLE

The EDEC principle was designed as a general guideline for the provision of both direct and indirect restorations. (S.J. Davies, 2008a) It may be readily adapted to the requirements of implant-supported restorations.

The E.D.E.C. Principle:

- E Examine
- D Design
- E Execute
- C Check

### 1) Examination

During the examination phase, apart from assessing the bone quality and quantity at the implant site, care should be taken to examine the entire articulatory system. Occlusal load has a profound effect on the quality of osseointegration. Therapy should be provided for any pre-existing TMD in order to avoid acute exacerbations. (Davies, 2010)

No occlusion is intrinsically wrong, but any occlusion may be subjected to an intolerable quantity of function or parafunction, at a certain stage in the patient's life. An occlusion should only be judged by the patient's reaction to it. This could be at the tooth or tissue level, the system level, such as when TMD develops in relation to a parafunctional

habit, and the patient level, such as when an individual becomes hypersensitive towards the function or aesthetics of his or her occlusion. (Davies, 2007)

Occlusal sketching, rather like intra oral photography, enables the clinician to maintain a 2D record of pre-treatment static and dynamic occlusion. These records are a reliable tool for model verification, a means of communication with the dental technologist, an excellent means by which occlusion may be checked at the fit appointment and a permanent baseline record for future monitoring. (Davies, 2004)

Facebow recording is essential to relate the model to the center of rotation of the articulator's hinges. (Davies, 2014)

The unfavorable blood supply and protective reflexes associated with implant borne prostheses may cause tissue level reactions to be less predictable than those occurring in a dentate individual. They are likely to happen more quickly, with less warning and are more likely to be catastrophic or irreversible. They may be harder for patients to avoid and may also occur as a result of less load or frequency than seen in the natural dentition.

### 2) Design

In the design phase, the occlusion is prescribed, and the placement of implants planned, ideally in that order to avoid irreversible, injudicious placement. Study models should be cast, mounted and verified. At this stage, the restorative clinician should decide on whether to conform to the existing occlusion, in which case the existing centric occlusion should be recorded

and maintained, or whether the occlusion requires reorganization. If this latter is inevitable, centric relation has to be recorded. If this is not identical to centric occlusion, a decision has to be made whether equilibration is required.

A mock equilibration, allows the clinician to reversibly gauge the feasibility of the procedure, prior to irreversibly altering the patient's tooth morphology. A design wax-up may then be fabricated, which in turn allows for the creation of a surgical stent. (Davies, 2010)

Post- surgically, the design of the occlusal prescription should encourage a light occlusal load, the avoidance of cantilevers, freedom in centric occlusion, a narrow occlusal table with low cuspal angles. Posterior interferences and incline contacts should be avoided to prevent excessive lateral forces.

### 3) Execution

Accurate implant placement is facilitated by the combined use of prosthodontic stents and 3D imaging. (M. Z. Kola, 2015) (Talwar.N, 2012)

If possible, the occlusion of implant-borne restorations should conform to the existing occlusion. If re-organization is required, it may be prudent to utilize long-term provisional restorations to gauge the patient's adaptive capabilities. (Davies, 2010)

### 4) Check

Occlusion may be verified against pre-treatment records, in line with the limitations of implants. As natural teeth move more readily under occlusal loading, implants should be maintained in light occlusal contact. Since

the patient's occlusion is likely to change over time, for example due to physiological or pathological wear, the occlusion of implant borne prostheses should be regularly monitored with thin articulating paper. (Misch, 2005)

## RADIOGRAPHIC ASSESSMENT

The American Academy of Oral and Maxillofacial Radiology (AAOMR) has provided a review of the available literature regarding selection criteria for the use of radiology in implantology. Recommendations have been provided for three distinct phases; The initial examination, the preoperative, site specific assessment and finally, postoperative imaging (D.A. Tyndall, 2012)

## THE INITIAL EXAMINATION

The initial radiographic examination should be based upon on the patient history, clinical examination and treatment plan. The imaging modality of choice is usually panoramic radiography supplemented by periapical radiographs, allowing the clinician to assess the overall oral health status.

Panoramic radiographs are useful as an initial diagnostic tool, due to their ability to detect gross pathology in the entire dentition and general anatomic features such as the TMJ, inferior dental canal and the maxillary sinus. Their main disadvantage is their inconsistent magnification and geometric distortions. (D.F. Tamimi, 2014)

Periapical radiographs are readily available and, with the correct use of the long cone paralleling technique, give an accurate representation of the mesio-distal and vertical dimensions of the site. (E. Whaites, 2013)

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FIGURE 3: RECORDING CENTRIC RELATION



After finding centric relation, soft greenstick compound may be used to produce a template to ensure that the patient is indeed closing in C.R. rather than inadvertently retuning to the C.O. during bite registration.



Bite registration material is added and allowed to set.



The greenstick compound is removed, and more bite registration material is added, producing a full arch centric relation registration, which may be utilized by the dental technologist to articulate models in C.R.



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Occlusal radiographs may provide information regarding the facio-lingual width and the mandibular contour. However, this information may be readily found in diagnostic study models, and their use is rarely justifiable. (D.A. Tyndall, 2012)

## SITE SPECIFIC

The main shortcomings of conventional radiography are that they rarely provide a 3D visualization and reliable measurements of the implant site, especially in the facio-lingual direction. Hence, the preoperative, site-specific assessment should ideally include cross-sectional imaging in the form of CT or CBCT. (Brown, 2008)

In both, the diagnostic information is collected by x-ray attenuation of voxels of the imaging volume by a single detector, which converts it to different shades of gray. The main difference on how they acquire data is that, in a CBCT, the entire volume of information is collected in one revolution, while it is collected in stacks, or multiple revolutions in the case of a CT scan. (C. Angelopoulos, 2011)

CBCT is currently the technique of choice, mainly due to its lower radiation dose, better availability and lower cost.

In general, software available for CBCT is more practical for implantology than that available for CT. 3D imaging is especially useful if augmentation procedures are being considered or have already been carried out prior to implant placement. (D.A. Tyndall, 2012)

## POSTOPERATIVE

Imaging may be used to confirm

the correct location of the implant following its insertion. Conventional radiography is normally considered preferable to CBCT as titanium implants may produce artifacts, including beam hardening and streak artifacts, which may mask changes in peri-implant bone. (D.A. Tyndall, 2012)

Periapical radiographs may readily be used to assess for the presence, and maintenance of osseointegration.

They may also be used to evaluate the fit of impression posts prior to impression taking, to evaluate the fit between abutments and implant and in the case of cemented crown and bridgework, to ensure that all excess cement has been removed. (D.F. Tamimi, 2014)

## SUMMARY

It may be argued that, with the contemporary, stringent standards in undergraduate dental schools, most clinicians graduate having the knowledge and technical competence to carry out several restorative and prosthetic procedures as well as minor oral surgery associated with implantology.

What is commonly perceived to be more challenging, is the ability to formulate a comprehensive, multidisciplinary treatment plan, which allows for holistic care, suiting the patient as an individual rather than the individual's dentition.

This is only possible when information pertinent to the individual case is compiled and made sense of. (Bain, 2003) Hence rather than being daunted by the process, clinicians planning and / or providing implant-borne restorations should ensure their data gathering is thorough, systematic and pertinent to the individual being cared for. ■



Figure 4: A periapical radiograph taken with impression post in place, ensuring optimal seating.

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## Decision in Maltese Dental Technologists Case

Court reaffirms that protection of health and life of humans take priority in EU Treaties

The Court of Justice of the European Union (CJEU) judgement from 21 September 2017 (Case C-125/26) reaffirmed that Member States may determine the degree of protection which they wish to afford to public health and the way in which that degree of protection is achieved.

Since the levels vary between Member States, they must be allowed a measure of discretion.

Starting point of the case was a court proceeding in Malta, in which the plaintiffs – clinical dental technologists – are seeking official recognition for the profession of ‘Clinical Dental Technologist’ in Malta to enable clinical dental technologists from other EU Member States or Maltese nationals who obtained the relevant qualifications from another EU Member State to freely and autonomously practice in Malta.

As a result of its considerations, the Court followed that the protection of public health constitutes an overriding reason in the general interest capable of justifying a restriction of the freedom of establishment and that it is appropriate for a Member State to require compulsory intermediation of a dental practitioner to protect patients’ health and safety. The case is now referred back to the Maltese Court.

The Council of European Dentists (CED) welcomes this judgement and urges the Commission and Member States to ensure that the protection of public health is considered as a priority in policy making. ■

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- Claims support in the event of a claim

On the other hand if your policy is already insured under the scheme, you need to ensure that:

- Your limit of indemnity is still adequate;
- Your cover still reflects your present operation, example if you are performing Botox &/or Dermal fillers you have availed yourself of the relative extension.



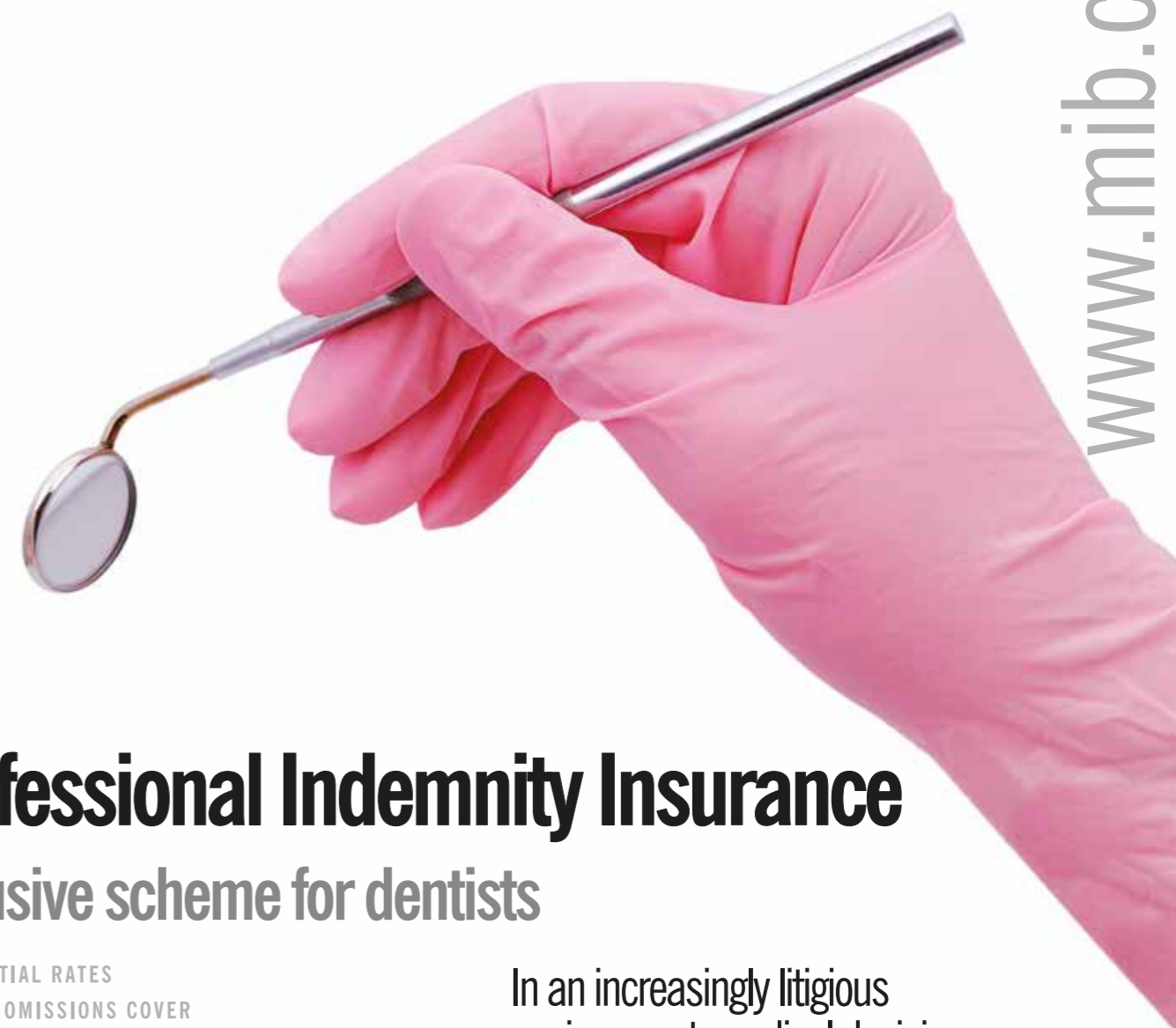
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to help prevent moments like these



CHMLT/CHSENSO/0032/17

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\*With twice-daily brushing

**New Sensodyne Rapid Relief is a unique formulation engineered for speed** that supports accelerated occlusion of dentine tubules.<sup>1</sup> It provides clinically proven relief in just **60 seconds** after brushing sensitive areas,<sup>2,3</sup> giving patients long-lasting protection\* from sensitivity and its impact on everyday life.<sup>4,5</sup>

Reference: 1. Accepted for presentation at IADR 2017, Abstract no: 2631820. 2. GSK Data on File 207211, January 2017. 3. Accepted for presentation at IADR 2017, Abstract no: 2635085. 4. Parkinson CR et al. Am J Dent. 2015 Aug;28(4): 190-196. 5. Baker S et al. Longitudinal validation of the Dentine Hypersensitivity Experience Questionnaire (DHEQ). Poster presented at IADR/AADR/CADR General Session & Exhibition; 2013 March 20-23, Seattle, Washington. Date of preparation: June 2017. CHMLT/CHSENSO/0032/17

# FUNCTIONAL APPLIANCES: AN EVIDENCE-BASED APPRAISAL

By Jan-Marc Muscat

## Working Definition

*"An orthodontic appliance which harnesses (uses) the facial and masticatory muscles to produce changes in arch or tooth relationship"*

Prof. RT Lee 2011

## Role

- **Primary role is in the correction of Class II malocclusion**
- Mild Class III – Reverse twin blocks
- Anterior open bite cases – Frankel IV
- Habit breaking appliance
- Obstructive sleep apnoea

## Indications in Class II

- 'Classic' functional appliance case
- Interceptive Treatment
- Compromise treatment
- Anchorage reinforcement



## Mode of Action

- Their primary mode of action is by producing a distalising effect on the maxillary dentition and anterior force on the lower (**dento-alveolar changes**)
- Mills (1978; 1983) found a 2mm apparent change in mandibular growth
- Alter soft tissue environment – (in)direct effects
- TMJ changes favourably in an anterior direction albeit this is temporary (Pancherz & Fisher 2003)

## Evidenced Based Rationale



## Randomised Controlled Trials

- To date all RCTs in this field have concluded that the average enhancement of mandibular growth is approximately **1mm** with a **fairly large standard deviation**
- O'Brien et al. 2003 → Multicentre RCT 174 patients aged 8-10 change 70% dentoalveolar 30% skeletal
- Cochrane Review 2013 –  
*"there are minor beneficial changes in skeletal pattern, however, these are probably not clinically significant"*



# FUNCTIONAL APPLIANCES: AN EVIDENCE-BASED APPRAISAL

Continues from page 29.

## Timing of treatment

- Depends on the trifecta:



## 1. Dental Factors

- Since the changes achieved are primarily dento-alveolar, it follows that the best time to start is when permanent teeth have erupted
- A substantially earlier start/ two-stage treatment risks prolonging treatment with resultant patient fatigue
- Problems with appliance retention due to shedding/morphology of primary teeth
- Issues with co-operation

## 3. Growth – Can we predict ?



## 3. Growth - conflicting views

- Bacetti (2000) → efficacy is dependent on coincident treatment with the pubertal growth spurt
- Tulloch (1997), Ghafari (1998) → little to be gained from precisely timing the treatment to specific age/maturity markers
- O'Brien 2003 suggested that total beneficial growth is at its maximum when growth is at its most helpful (11.5)

## 1. Dental Factors – Trauma

- IOTN: OJ > 6mm → definite treatment need
- Todd & Dodd → OJ > 9mm are associated with a 45 % increased risk of trauma
- Dewhurst → 35% of 9 year olds have evidence of trauma regardless of OJ values



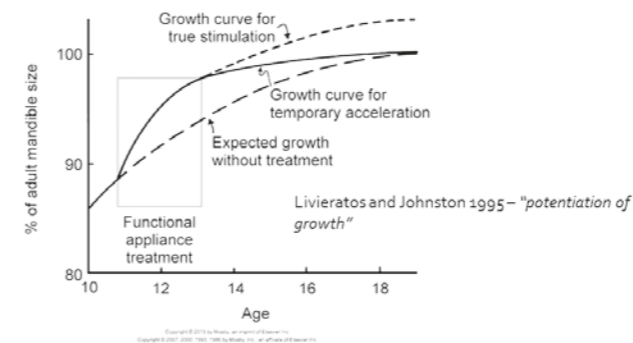
## 2. Psychological factors

*"There is no doubt that social responses conditioned by the appearance of the teeth can severely affect an individual's whole adaptation to life. this places the concept of handicapping malocclusion in a much larger and more important context."*

Proff  
itt



## 3. Growth



## Compliance

- O'Brien 2003 → 83% Compliance rate with a significantly lower failure-to-finish rate in the younger patients when treated by the same operator with same appliance
- Banks 2004 → patients younger than 12.3 years were three times more likely to complete functional treatment with twin blocks

## 2. Psychological Factors

- O'Brien 2003 → increased self-concept and reduced negative social experiences
- O'Brien 2009 → patients receiving early treatment with twin block treatment were perceived to be more attractive than those who did not



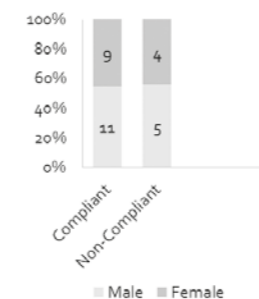
## 3. Growth

- Long dogma is to centre functional appliance treatment around the pubertal growth spurt
- This has often led to confusion with respect to timing of treatment and at times some red faces...



## Some Local Data....

- 2013- 2015 saw a 30% increase in Twin Blocks done at MDH (n = 269) --> Data before 'The Great Escape'
- Mater Dei Audit → Compliance rate over a 6 month period 67% (n=30)



## Choosing a functional appliance

- Does an appliance produce different skeletal/dental effects?
- Is it more easily tolerated?
- Does it work more rapidly?
- Easier to make and repair?
- Can concurrent procedures be carried out?
- Cost?

Continues on page 32.



# FUNCTIONAL APPLIANCES: AN EVIDENCE-BASED APPRAISAL

Continues from page 31.

## Choosing a functional appliance

- Johnston (1986)  
"Despite claims to the contrary, the superior functional appliance has yet to be demonstrated."
- Several studies however hint at incisal tipping and skeletal response as being inversely related.  
*Efforts should be made to limit former*

## Choosing a functional appliance....

- The list of functional appliances keeps growing every year
- At times seem to be reinventing the wheel
- Twin Block is the most commonly functional appliance in the UK...used by 75% of orthodontists (Chadwick et al. 1998)

## Twin Blocks – hours of wear

- Systematic Review (Al-Moghrabi et al. 2017) →  $\square$   
"Compliance with removable orthodontic appliances and adjuncts is suboptimal, and patients routinely overestimate duration of wear."



## Twin Blocks – Duration of treatment

### BOS Advice

- Treatment time varies based on how severe the problem is.
- Most of the work with this brace is usually completed in 9 to 12 months.
- After this a period of nights only wear may be advised to maintain the improvement



## Twin Blocks –Clark 1982

### Advantages

- Well tolerated
- Easy to repair
- Fairly easy to advance
- Compensatory expansion is easy
- Suitable for mixed or permanent dentition

### Disadvantages

- Compliance and adaptation issues as with any other removable appliance
- Retention issues with lower appliance
- Posterior open bite

## Twin Blocks – tips

- 7-8mm thick bite is the secret of success with twin blocks
- Over-correction
- Watch your centrelines!



## Involve the patient

- Colours – works with fixed appliances!
- Cureton (1995) showed that active interest in patients headgear charts increased headgear wear significantly.



Name:	DATE	APPLIANCE	WELL	OK	POOR	NOT WEAR	REMARKS

## Treatment Stability

- Maxillary changes more stable than mandibular (Pancherz 1991)
- Good buccal interdigitation reduces need for relapse
- Lower lip coverage /competence
- Systematic Review (Bock 2015) – Good stability expected but evidence limited to Herbst treatment

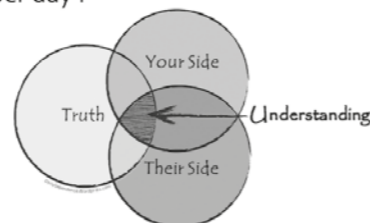


## Twin Blocks – design

- Yaqoob (2012) → no difference in dental and skeletal effects with respect to labial bow
- van der Plas (2017\*) → lower incisor capping does not significantly reduce lower incisor proclination
- Trenouth & Desmond (2014) → presence of a Southend clasp limited incisor tipping

## Twin Blocks – hours of wear

- General recommendation is for full-time wear
- Shäfer et al. 2015 → most patient only wore their appliances 9 hours per day!



## Good buccal interdigitation

- Trim upper block whilst maintaining A-P inclination
- Transition to fixed appliance with clip-over anterior bite plane or Hg
- Tail out wear – lazy?



## Summary

- There are limited advantages to providing early orthodontic treatment of Class II malocclusion.
- Most of the reduction in overjet is achieved by tooth movement. There is minimal skeletal change and this cannot be predicted.
- Whilst exact treatment timing is not essential compliance seems to be better in younger age groups
- There are no differences in the treatment result of fixed and removable functional appliances
- The Twin Block is the most popular functional appliance in the UK.
- There is no point in putting on or leaving off the labial bow on a Twin Block.
- No one can grow a mandible!



# THE POWER OF THE DENTAL SURGERY ASSISTANT

## A Little Bit About Luke and Denise.....

41  
Squash & Gym  
2 Dogs, 3 Cats  
Geordie to Marsaxlokk  
3 businesses:-  
Customer Service Consultancy;  
Social Media Agency;  
Leadership Development, Training  
and Coaching



61  
Squash & Gym  
1 Dog  
Geordie to Marsascala  
Experience:-  
Dental Surgery Assistant  
Small Retail Sales  
Large Retail Sales  
Retail management  
Multi-site retail trainer

Luke Todd & Co. @luketoddandco #superhumanisation

Do we have any Dental Assistants in the room?

Luke Todd & Co. @luketoddandco #superhumanisation

Don't forget the patient! Don't forget them in surgery!

- Be aware at all times; the dentist and their needs; the patient and their needs
- The patient is always aware of you, so be aware of them
- Also act accordingly
- Reassure them if they seem anxious
- Support the dentist - let them focus on the issues whilst you support the patient

Luke Todd & Co. @luketoddandco #superhumanisation

Are you always running behind schedule?

Luke Todd & Co. @luketoddandco #superhumanisation

Don't forget the patient! Don't forget your premises!

On average 20% of people have some fear of the dentist.

Working in an environment heavily focused on equipment and set-up of the equipment its easy to forget that patients may get stressed when visiting the dentist.

Be aware of the physical things that may affect the patients negatively. This gives you an advantage of offering better patient experiences.

Prepare not only the dentist room but also the surgery communal areas.

The entrance to the building should be welcoming, customer friendly, with distractions from surgery noises.

Luke Todd & Co. @luketoddandco #superhumanisation

Do we have any Dentists or Surgery Mgrs in the room?

Luke Todd & Co. @luketoddandco #superhumanisation

Don't forget the patient! Don't forget bye's are also hello's!

- Patients who have a bad experience will tell at least 10 people of this
- Someone who hears of a bad experience by someone else will tell at least 4 people
- Don't forget to thank the client as they are leaving and that you will see them again soon
- The incoming patient will also see/hear this and it will put them at ease - you care.

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How do you make these patients feel comfortable?

Fear of the Dentist	Professional
Pressed for time	Executive
Bad experiences in the past	Manual Worker
Don't mind the dentist	Office Worker
Other stresses	At home
Worried about their teeth/gums	Parent
First time (last time)	Child

What are the implications of not?

Luke Todd & Co. @luketoddandco #superhumanisation

Don't forget the patient! Don't forget the Dental Assistant!

- Present a professional image
- Greet the patient with smiles and eye contact
- Observe the body language for signs of anxiety or tension
- Show empathy
- Actively listen
- Avoid jargon and chat in a calming manner
- Treat them how you would want to be treated in a similar situation

Luke Todd & Co. @luketoddandco #superhumanisation

We are all patients aren't we?

Luke Todd & Co. @luketoddandco #superhumanisation

The dental assistant as the ethos of great service

- Bad reputation spreads - sometimes technical skills aren't enough
- Its easier to invest in your team to provide great service than to try and turn around a bad rep
- A great surgery has no weak links and is EMPATHETIC
- You want positive word of mouth (literally)
- Your dental assistant should be technically capable to support you and personally capable of supporting your patients

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Dental Assistants  
The new service superhero

Think about the teeth.  
Think about the individual patients needs?  
Patient Goes Somewhere Else?  
Or even worse.  
Think about the teeth.



# UPDATE ON DIAGNOSIS AND PATIENT COMMUNICATION: MODERN HANDLING OF COMPOSITES ON FIXED AND REMOVABLE DENTURES

By Andreas Kopietz. Lecture at Radisson St Julians organised by Bart Enterprises.  
Summarised by Dr David Muscat.

The diagnostic white and pink wax-up and mock-up is a useful tool so that the dentist and patient can achieve a desired goal. A potential treatment outcome is modelled in wax prior to treatment and transferred to the patients mouth using silicone indices and autopolymerising resin and pink composite. This way one can obtain the patients approval.

Set ups are important in a functional temporary, creating and the try in of a milled framework out of a high performance polymer. There is a special focus on red-white aesthetics. Pink composites are used.

## ANAXDENT

The new outline is the tooth coloured polymethylmethacrylate. This is the ideal material for mock-ups and durable temporaries. There are various dentines and enamels. The material has a high flexural strength and good

modulus of elasticity so is less likely to fracture. It is tissue friendly and can be highly polished. There are also opaque dentines which can be used to conceal frameworks. Pontic designs and gingival management can be planned directly in the mouth.

The wax up is duplicated and NEW OUTLINE acrylic is poured into the matrix and repositioned on the model. This can then be fixed into the patient's mouth for a short period of time. This is called the 'test run' or the 'prototype'. Shape and function can be determined special ANAXFORM FLASK is used. There are several stains and skin glazes that can be used.

## THE PEKKTION IVORY

This is a high performance polymer for definitive aesthetic restorations on implants. It is the latest solution for aesthetic, patient friendly restorations. It

has similar properties to human cortical bone and human dentine.

A Pekkton Ivory framework provides the patient with a lightweight aesthetic and extremely strong restoration. Other indications include removable restorations such as bars and telescopic crowns; occlusal bases and dentures bases. Denture supported veneered single crowns with a maximum of one pontic on natural teeth can be made. It may also be used for crown margins and backings.

Pekkton Ivory is shock absorbing; can be used for milling and pressing. It is metal free; has low water absorption; is radioopaque; it can be sterilised and is biocompatible. It can be used as an analog or for digital processing for an excellent fit and full control in the dental lab. It is time saving and results and consistent quality are guaranteed. ■



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With fluoride (toothpaste: 1450ppm, mouthrinse 248ppm).

Coenzyme Q10 and pomegranate contribute to the long-term protection of the gingival and dental tissues<sup>4-8</sup>.



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gums and teeth for the long-term  
without compromising your patients' oral health

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1. Arai T, et al. Nihon Shishubyo Gakkai Kaishi 1999; 41(4):450-60 ; 2. Saito T, et al. Arch Oral Biol 1997; 42(8):539-45 ; 3. Gallob JT, et al. J Clin Periodontol 2015; 42:740-7 ; 4. Sadeghi N, et al. J Agr Sci Tech 2009; 11:633-8 ; 5. Chaturvedula VSP, et al. Int J Res Chem Environ 2011; 1(1):1-18 ; 6. Flanagan D. Inside dentistry 2006; 2(9) ; 7. Rajan S, et al. J Orofacial Res 2013; 3(1):38-41 ; 8. Narayan T, et al. IOSR-JDMS 2014; 13(8):29-34.

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J. Journal of Clinical  
Dentistry 2013



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