

NON-SURGICAL PERIODONTAL THERAPY- RATIONALE USE OF CHEMOTHERAPEUTICS

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RESOURCES

- Carranza 13th Edition
Chapters 47, 52, 53

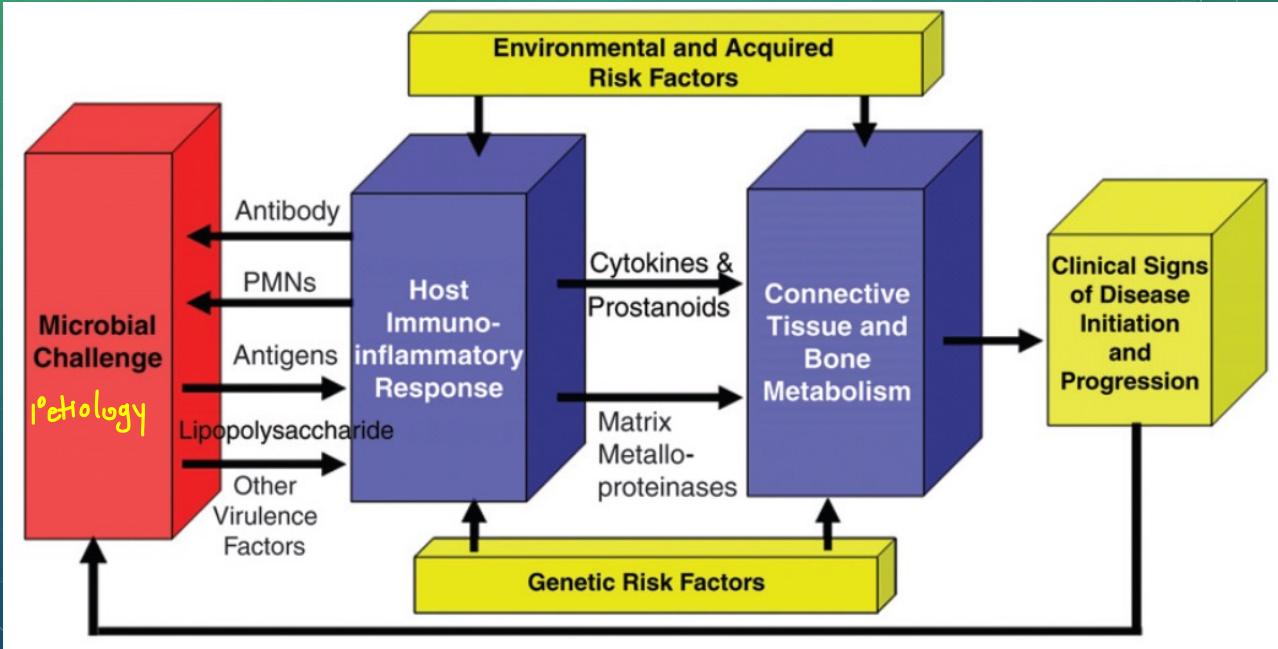
LEARNING OBJECTIVES

1. Describe types of non-surgical periodontal therapies
2. Describe the rationale and evidence for non-surgical periodontal therapy
3. Discuss the use of adjunctive systemic and local antibiotics in the management of periodontal disease
4. Describe host modulation therapy

RESOURCES

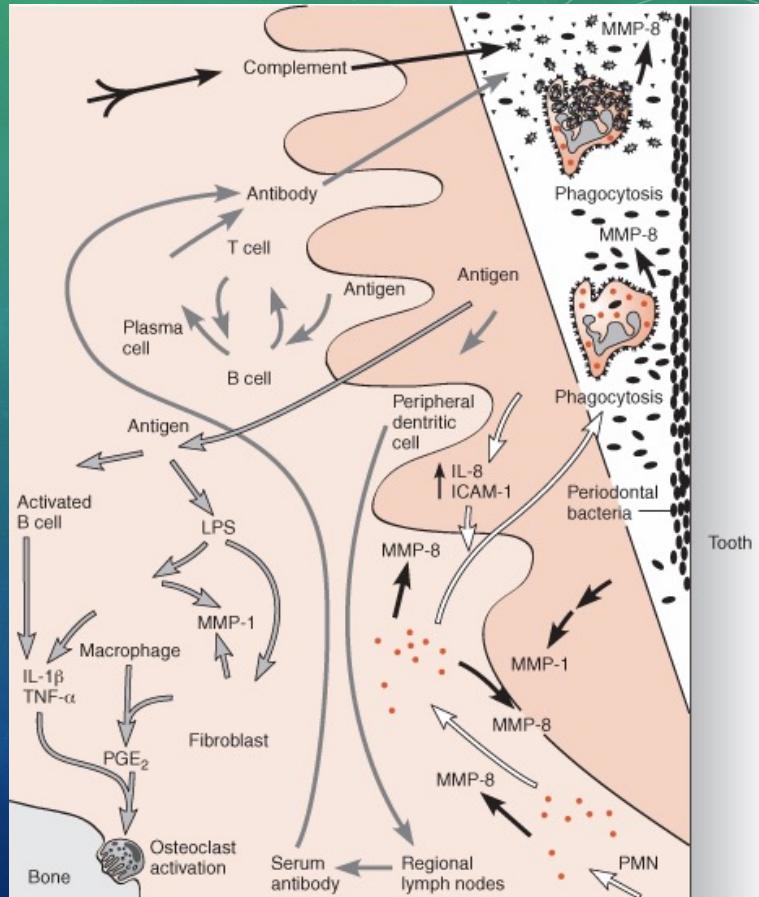
- Carranza 13th Edition
Chapters 47, 52, 53 *not req'd reading*

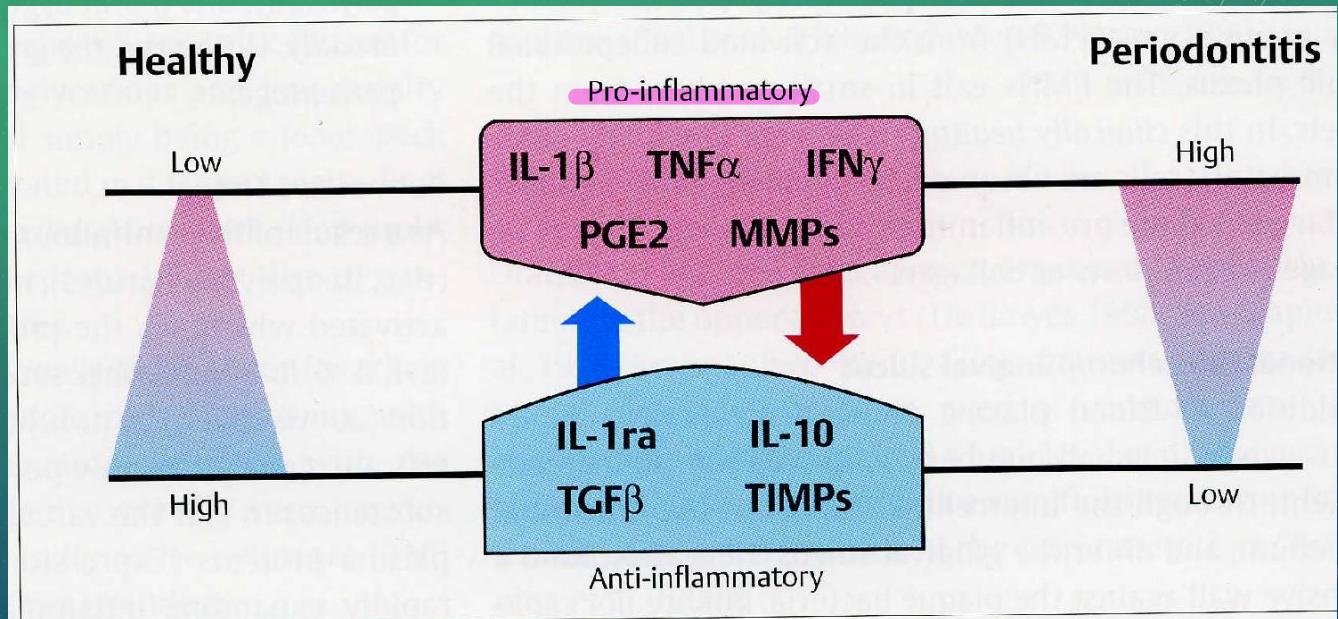
PATHOGENESIS OF PERIODONTAL DISEASE



HOST-MICROBIAL INTERACTIONS

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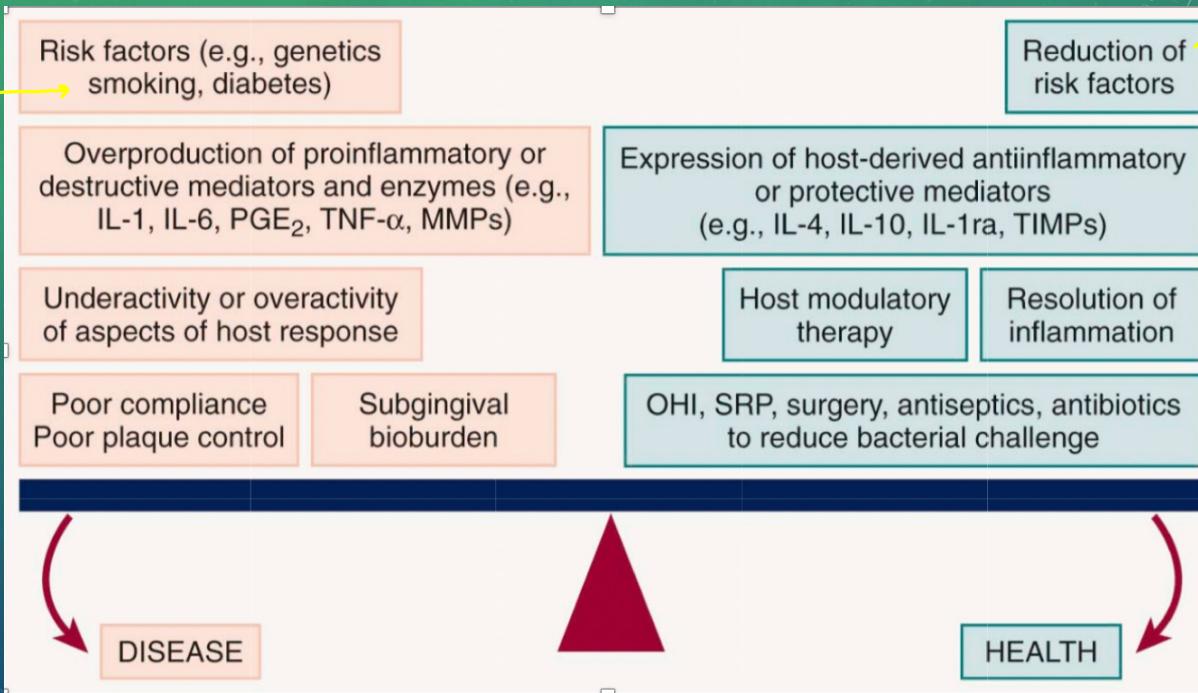


- A **pro-inflammatory** phenotype predisposes to periodontal tissue destruction.

GOALS OF PERIODONTAL THERAPY

- Short Term:
 - *elimination of gingival inflammation and correction of the conditions that cause and perpetuate it.*
- Long Term:
 - *reconstruction of a healthy dentition that fulfills all functional and esthetic requirements.*

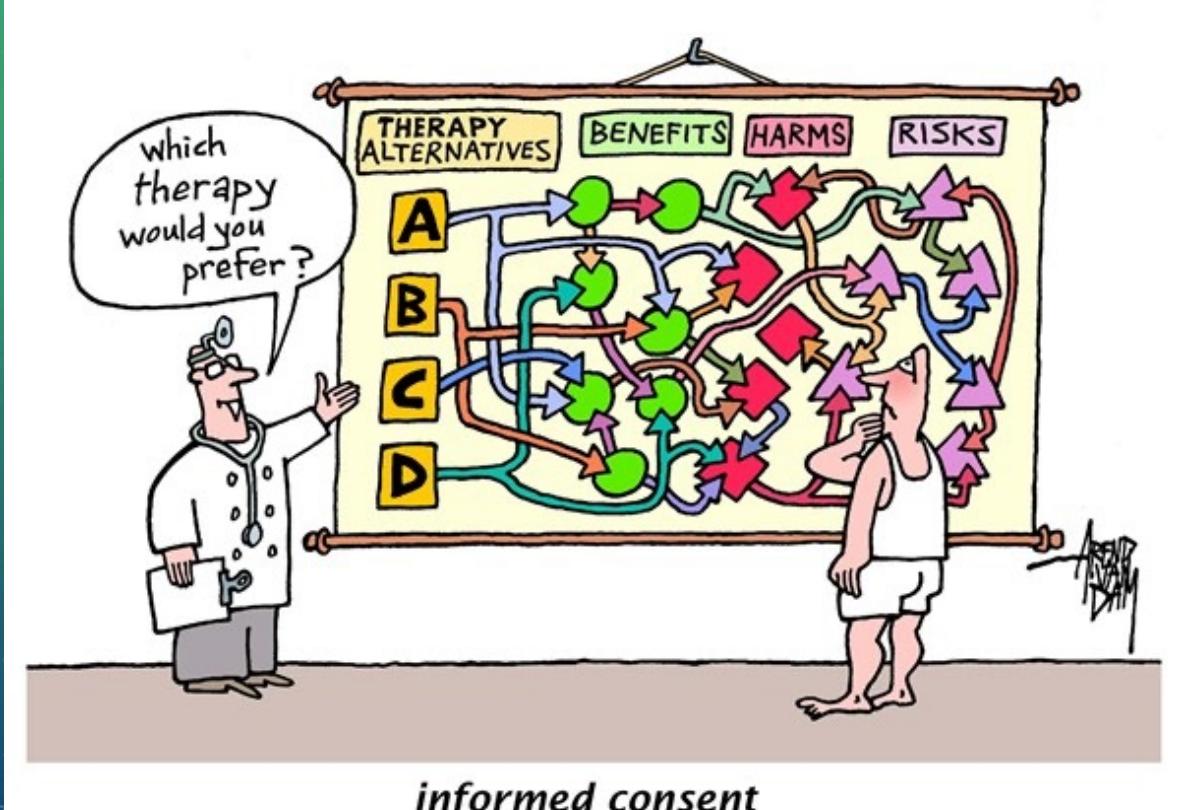
high risk



TREATMENT OF PERIODONTAL DISEASES

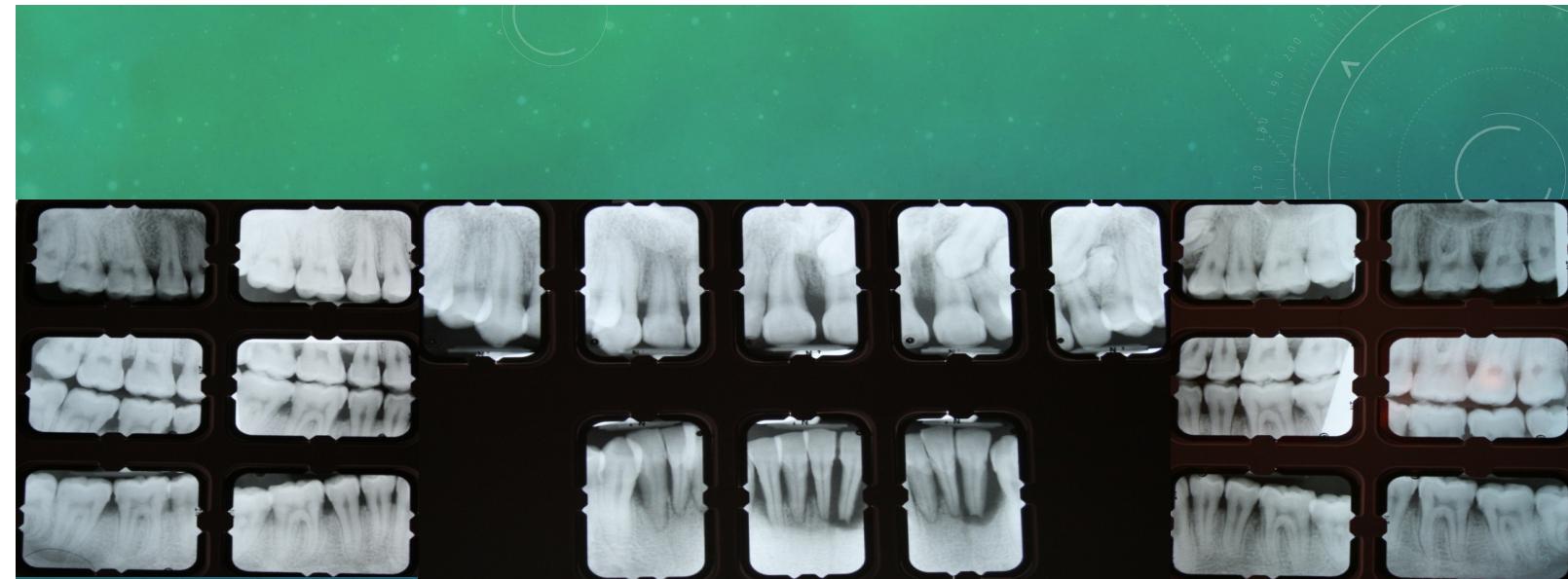
- 1 • Examination-
 - Clinical and Radiographic Exam
 - Periodontal Data Collection
- 2 • Diagnosis
- 3 • Prognosis
- 4 • Treatment Plan







- plaque, calculus (local factor)
- generalized inflam.



- general bone loss
- odontoma

Stage of Therapy:
(CIRCLE ONE)

CAL & BOP
PD & Plaque
CEJ - GM

Pre-treatment

5	1	6	2	3	4	5	5	2	1	5
6	8	9	4	2	4	8	3	3	2	6
6	5	7	7	4	3	5	3	3	2	5
1	1	1	1	1	1	1	1	1	1	1

Re-evaluation

5	2	3	4	6	7	8	9	3	4	2
5	3	5	5	2	2	2	2	7	4	5
6	4	4	4	2	2	2	2	7	4	5
1	1	1	1	1	1	1	1	1	1	1

Post-treatment

1	3	2	4	4	8	3	7	5	6
2	3	5	5	2	2	2	2	7	4
5	3	5	5	2	2	2	2	7	4
1	1	1	1	1	1	1	1	1	1

Date of exam: 6/8/2010

Mobility Scale
Used: MILLER



CEJ - GM
PD & Plaque
CAL & BOP

RIGHT

1	2	3	4	5
8	5	2	3	4
5	6	4	7	4

6	7	8	9	10	11
5	7	6	7	10	8
4	6	5	6	10	9

12	13	14	15	16
4	3	3	3	4
3	2	2	2	3

FACIAL

LINGUAL

LEFT

CAL & BOP
PD & Plaque
CEJ - GM

6mm attachment →
loss

32	31	30	29	28
6	5	4	5	4
5	6	5	6	4

27	26	25	24	23	22
5	1	1	1	1	1
4	2	2	1	1	1

21	20	19	18	17
2	2	2	3	2
3	3	3	3	2

FACIAL

LINGUAL



CEJ - GM
PD & Plaque
CAL & BOP

32	31	30	29	28
6	5	4	5	4
5	6	5	6	4

27	26	25	24	23	22
5	1	1	2	1	1
4	2	2	1	1	1

21	20	19	18	17
2	2	2	3	2
3	3	3	3	2

PHASE I THERAPY

- Management of contributing **Systemic Risk Factors** – Diabetes, Smoking etc.
 - Consultation with patient's physician may be indicated
 - Evaluation of **Plaque Control** and *tailored* Oral Hygiene Instructions (OHI)
 - Supra- and Sub-gingival **Scaling and Root Planing**
 - Use of **Antimicrobial agents**
 - Control of **Local factors**
 - Removal or reshaping of restorative overhangs and over-contoured crowns
 - Correction of ill-fitting prosthetic appliances
 - Restoration of carious lesions
 - Odontoplasty
 - Tooth movement
 - Restoration of open contacts which have resulted in food impaction
 - Treatment of occlusal trauma
 - Extraction of hopeless teeth

can you
rule it out?



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local factor → overhang



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• Correction of ill-fitting prosthetic appliances

- Restoration of carious lesions
- Odontoplasty
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- Treatment of occlusal trauma
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ill-fitting prosthetic → plaque retention,
bone loss



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 - Correction of ill-fitting prosthetic appliances
- **Restoration of carious lesions**
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 - **Systemic and Local Delivery**
- Control of **Local factors**
 - Removal or reshaping of restorative overhangs and over-contoured crowns
 - Correction of ill-fitting prosthetic appliances
 - Restoration of carious lesions
- **Odontoplasty** *sharp edges*
 - Tooth movement
 - Restoration of open contacts which have resulted in food impaction
 - Treatment of occlusal trauma
 - Extraction of hopeless teeth



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 - Removal or reshaping of restorative overhangs and over-contoured crowns
 - Correction of ill-fitting prosthetic appliances
 - Restoration of carious lesions
 - Odontoplasty
- **Tooth movement** *e.g. splints, stabilize dentition*
 - Restoration of open contacts which have resulted in food impaction
 - Treatment of occlusal trauma
 - Extraction of hopeless teeth



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 - Odontoplasty
 - Tooth movement

- **Restoration of open contacts which have resulted in food impaction**

- Treatment of occlusal trauma
- Extraction of hopeless teeth



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- **Treatment of occlusal trauma**
 - Extraction of hopeless teeth

occlusal guard



splint



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 - Treatment of occlusal trauma
- **Extraction of hopeless teeth**



NON SURGICAL PHASE OF THERAPY

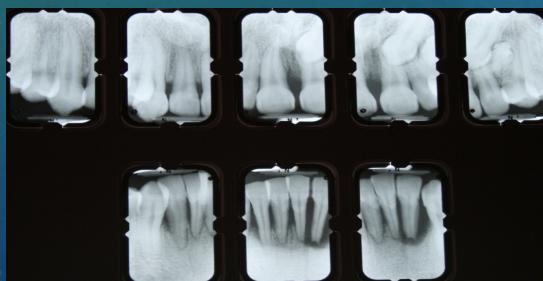
Scaling and Root Planing (SRP)

- **Scaling:** The removal of crown and root surface deposits and stains
- **Root Planing:** The smoothening of roughened cementum and dentin impregnated with calculus or contaminated with toxins or microorganisms.



OBJECTIVES OF PERIODONTAL THERAPY

- Reduction of microbial load *1° etiology.*
- Elimination of gingival Inflammation
- Cessation of gingival Bleeding
- Elimination of periodontal pockets and infection
- Re-establish periodontal health
- Arrest bone loss



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OBJECTIVES OF PERIODONTAL THERAPY

- Reduction of abnormal tooth mobility
- Establish optimal occlusal relationships
- Restoration of destroyed periodontal tissues
- Restoration of physiologic gingival contours
- Prevention of recurrence



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PERIODONTAL RE-EVALUATION

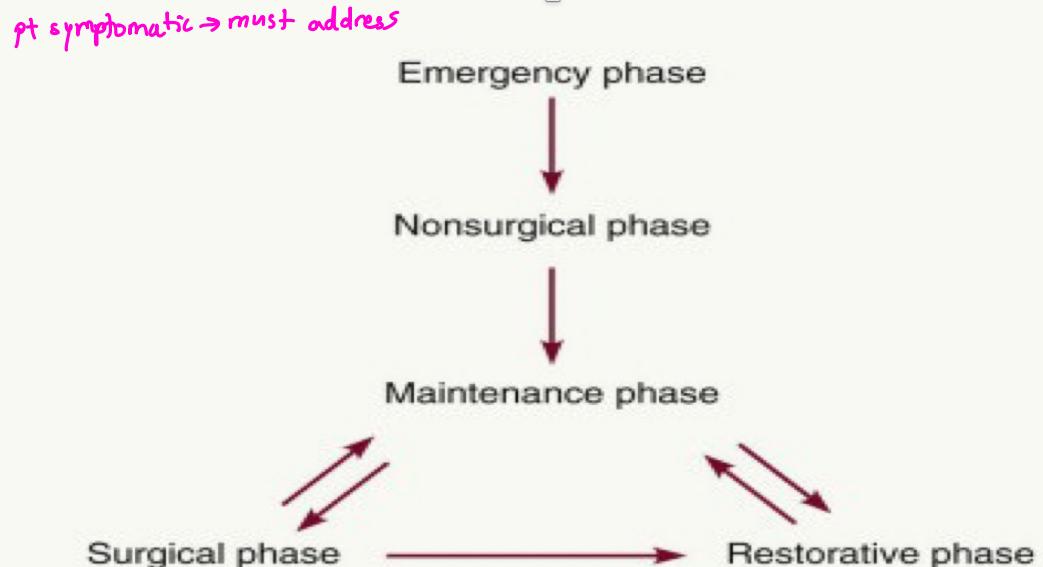
<4 wk → ging tissues not healed completely

- Evaluation of response to non-surgical periodontal therapy, 4-12 weeks after completion of therapy
- Periodontal assessment
 - Pocket Depths and CAL
 - Gingival Inflammation
 - Oral Hygiene (Plaque and Calculus)
 - Caries Control

Have things changed?



SEQUENCE OF PERIODONTAL THERAPY





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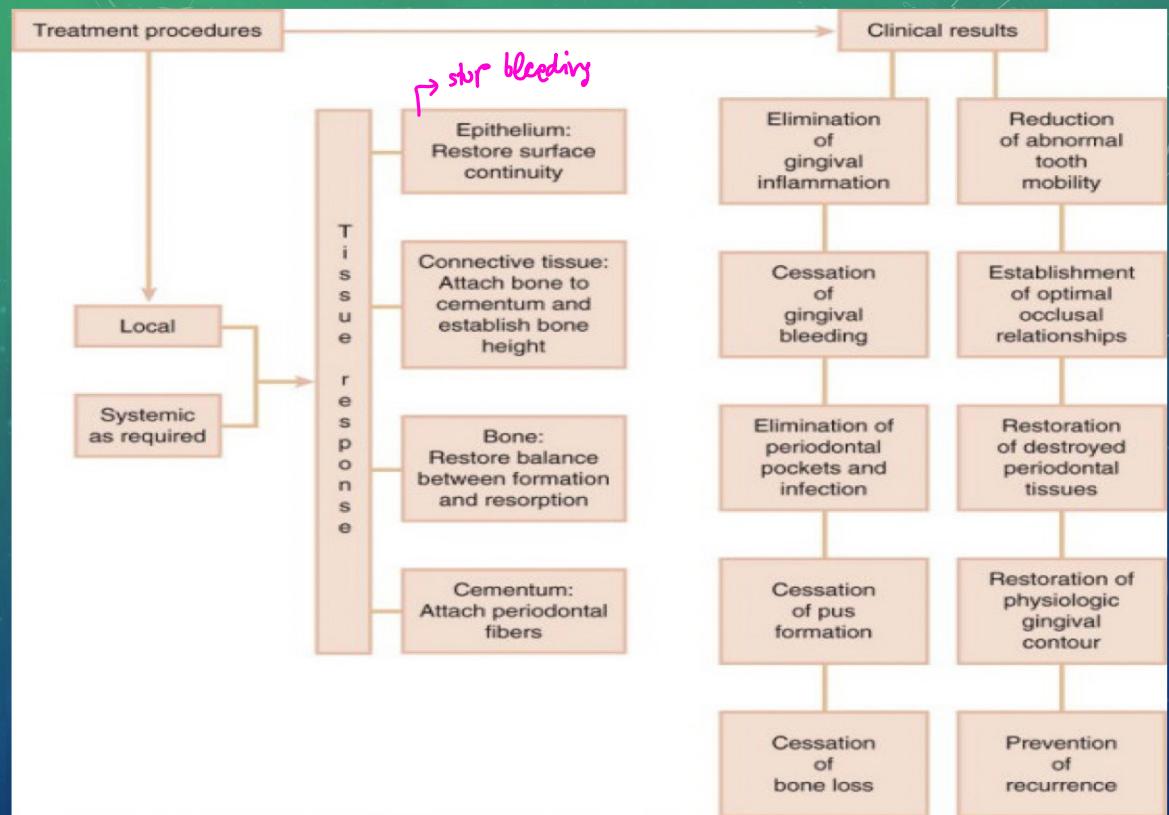


-swelling done
-recession
-abscess removed
-still local factors in re-eval



-↓ inflammation
-start building calc. already

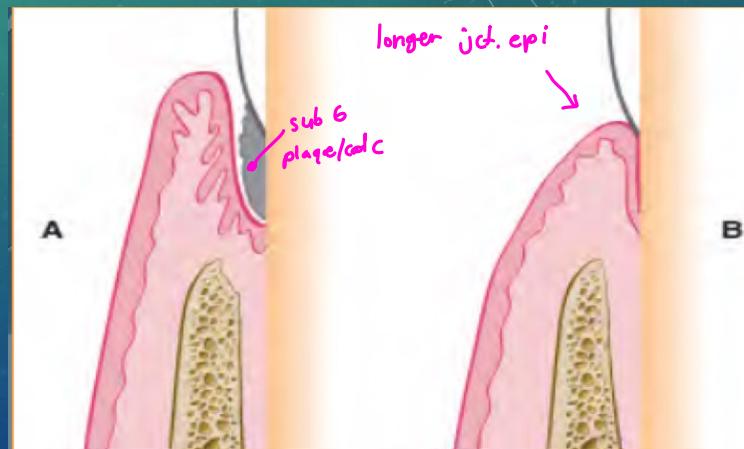
Benefits of Periodontal Therapy



HEALING AFTER NON SURGICAL PERIODONTAL THERAPY

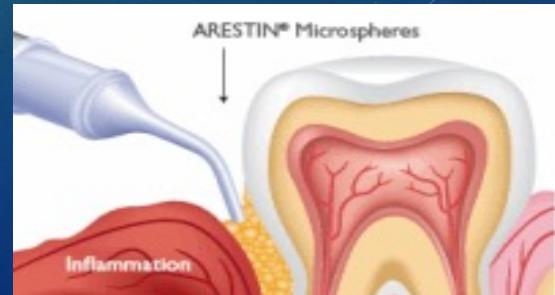
★ Test Q
CSA Q

- Repair by epithelial adaptation (close apposition of epithelium to the tooth surface, without gain in height of gingival attachment) and a *long junctional epithelium attachment*



ADJUNCTIVE ANTI-MICROBIAL THERAPIES

- Antibiotics
 - Local delivery
 - Systemic
- Chlorhexidine
- Phenolic compounds



ADJUNCTIVE ANTI-MICROBIAL THERAPIES

consider pt dexterity + compliance

- Sub-gingival irrigation:

- May use Chlorhexidine, Povidone-iodine, hydrogen peroxide or phenolic compounds
- Reduces gingival inflammation however minimal changes to plaque levels



ADJUNCTIVE ANTI-MICROBIAL THERAPIES

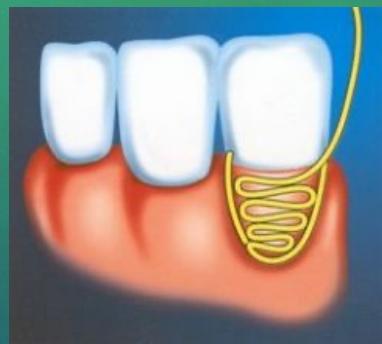
SYSTEMIC ANTIBIOTICS

common

when to rx?

Drug	Adult Dose
Metronidazole	500mg/TID/8 days
Ciprofloxacin	500mg/BID/8 days
Metronidazole + amoxicillin	250mg/TID/8 days of each drug
Metronidazole + ciprofloxacin	500mg/BID/8days of each drug
Doxycycline or minocycline	100-200mg/QD/21 days
Clindamycin	300mg/TID/8 days
Azithromycin	500mg/TID/14 days

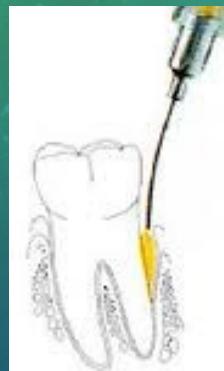
* ADJUNCTIVE ANTI-MICROBIAL THERAPIES LOCAL ANTIMICROBIALS



*
Actisite

Tetracycline-Containing
Fibers (12.7mg TCN HCL)

1st local delivery system in
US



Atridox

Subgingival Doxycycline
Hyclate – 10% gel



Periochip

2.5 mg chlorhexidine D-
gluconate in a biodegradable
matrix of hydrolyzed gelatin



Arrestin

2% Minocycline
encapsulated into
bioreversible microspheres
in a gel carrier

have in clinic

ADJUNCTIVE ANTI-MICROBIAL THERAPIES SYSTEMIC AND LOCAL ANTIBIOTICS

- RCT
- Sites with Initial PDs > 5mm
- Baseline to 24 months

Group (adjunct to scaling and root planing or periodontal surgery)	Patients (<i>n</i>)	Clinical attachment level gain (mm)	Probing pocket depth reduction (mm)
Scaling and root planing alone	23	0.92 ± 0.21	1.81 ± 0.23 ^{abcde}
Local tetracycline delivery	26	1.42 ± 0.22	2.11 ± 0.14 ^f
Systemic amoxicillin plus metronidazole	26	1.53 ± 0.16 ^a	2.36 ± 0.20 ^a
Systemic amoxicillin plus metronidazole plus local tetracycline delivery	28	1.50 ± 0.15 ^b	2.24 ± 0.13 ^b

ADJUNCTIVE ANTI-MICROBIAL THERAPIES

SYSTEMIC AMOXICILLIN/METRONIDAZOLE

- Systemic Review & Meta-analysis

Full-mouth analysis	Mean difference Δ (mm)	95% confidence interval	P-value for estimate
Chronic periodontitis			
Clinical attachment gain	0.21	0.02–0.4	<0.05
Probing-depth reduction	0.43	0.24–0.63	<0.05
Aggressive periodontitis <i>molar-incisor pattern</i> <i>stage 3, grade C</i>			
Clinical attachment gain	0.42	0.23–0.61	<0.00001
Probing-depth reduction	0.58	0.39–0.77	<0.0004

ADJUNCTIVE ANTI-MICROBIAL THERAPIES

SYSTEMIC AMOXICILLIN/METRONIDAZOLE

• In Smokers

Variable	Groups (no. of subjects)	Reduction in pocket probing depth from baseline (mm) (mean \pm standard deviation)	Intergroup difference in pocket probing depth	Gain of clinical attachment from baseline (mm) (mean \pm standard deviation)	Intergroup difference in clinical attachment
Moderate sites (4–6 mm)	Test (14)	1.4 \pm 0.10	<i>P</i> < 0.05*	1.2 \pm 0.11	<i>P</i> < 0.05*
	Control (15)	0.8 \pm 0.2		0.6 \pm 0.2	
Deep sites (\geq 7 mm)	Test (14)	3.4 \pm 0.6	<i>P</i> < 0.05*	3.1 \pm 0.6	<i>P</i> < 0.05*
	Control (15)	2.7 \pm 0.6		2.1 \pm 0.65	

ADJUNCTIVE ANTI-MICROBIAL THERAPIES

SYSTEMIC AMOXICILLIN/METRONIDAZOLE

Variable	Groups (no. of subjects)	Reduction in pocket probing depth from baseline (mm) (mean \pm standard deviation)	Intergroup difference in pocket probing depth	Gain in clinical attachment from baseline (mm) (mean \pm standard deviation)	Intergroup difference in clinical attachment
(a)					
Moderate sites (4–6 mm)	Test (29)	1.79 \pm 0.11	Not reported	1.36 \pm 0.10	Not reported
	Control (27)	1.13 \pm 0.11	P < 0.05	0.77 \pm 0.10	P < 0.05
Deep sites (\geq 7 mm)	Test (29)	3.90 \pm 0.29	Not reported	2.89 \pm 0.27	Not reported
	Control (27)	2.30 \pm 0.29	P < 0.05	1.78 \pm 0.26	P < 0.05
Parameter	Time point	Treatment groups (adjunctive to scaling and root planing)			P-value*
		Placebo (n = 27)	Amoxicillin and metronidazole (n = 29)		
(b)					
Glycated hemoglobin (%)	Baseline	8.99 \pm 1.63	8.53 \pm 1.56		0.35
	3 months	8.94 \pm 1.71	8.60 \pm 2.01		0.55
	6 months	9.07 \pm 1.69	8.49 \pm 2.17		0.33
	1 year	8.40 \pm 1.94	8.77 \pm 2.93		0.62
Fasting plasma glucose (mg/dl)	Baseline	158.95 \pm 41.48	151.55 \pm 31.76		0.51
	3 months	150.24 \pm 39.24	146.09 \pm 42.53		0.74
	6 months	153.00 \pm 48.67	145.36 \pm 35.88		0.56
	1 year	152.05 \pm 51.19	153.14 \pm 39.92		0.93

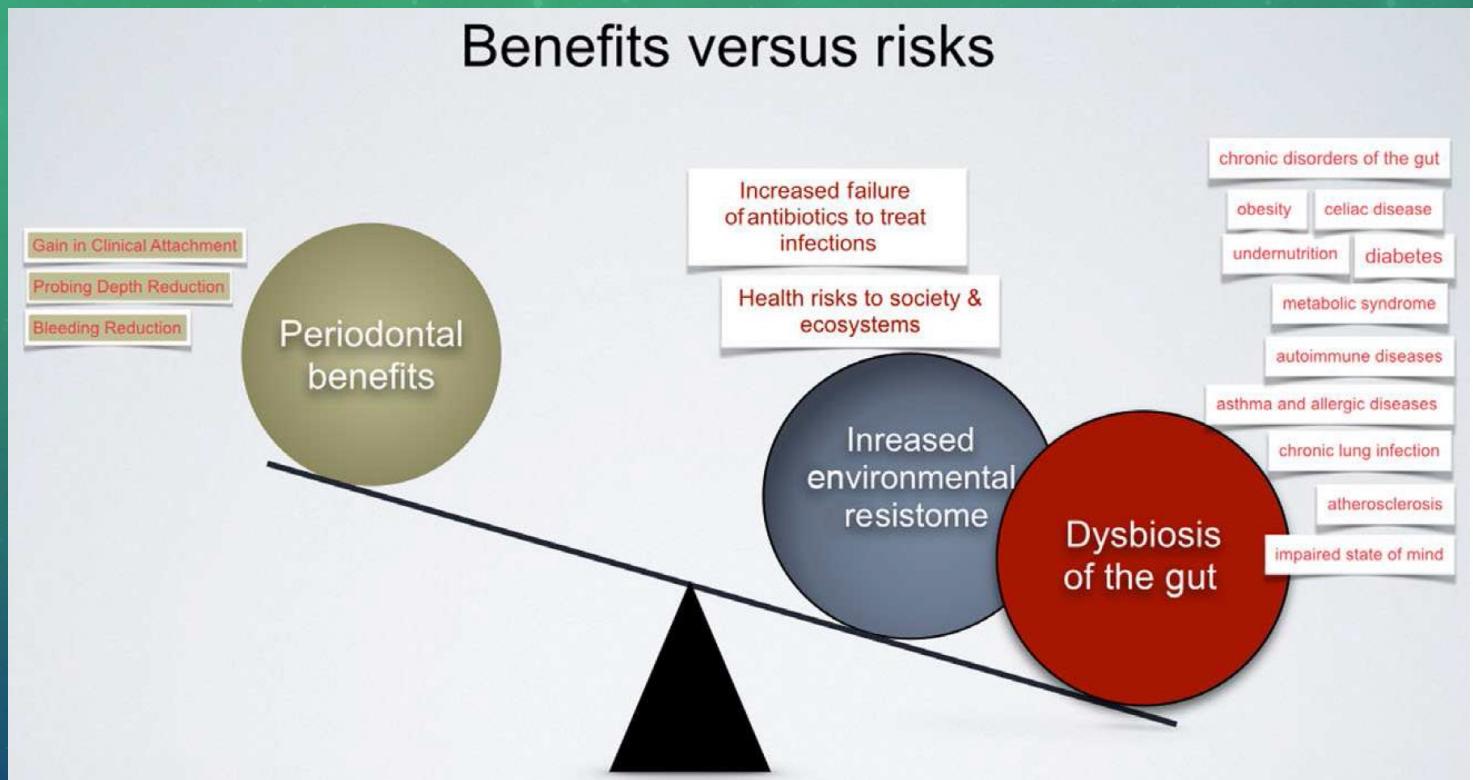
- In Patients with Uncontrolled DM diabetes

$\sim .5 - .6$ red

$.5$ red pocket depth

Miranda, TS et al, 2014
Jepsen, K & Jepsen, S., 2016

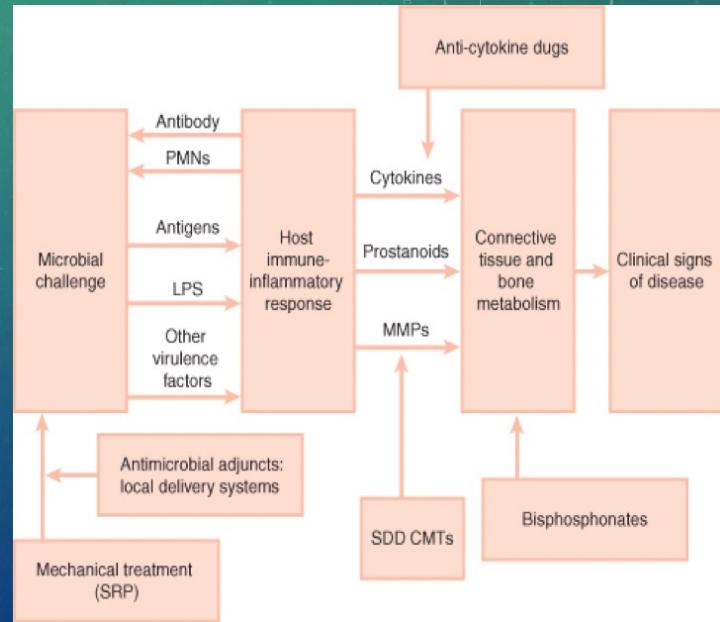
Rx Ab → risk v. benefit
ABR → minimal (0.5 mm - not clinically sig despite sig dif)
∴ no rx often : maybe smoker?



We have v. effective surg / non surg tx

HOST MODULATING AGENTS

- Anti-proteinases:
 - Subantimicrobial doxycycline (SDD, Periostat) – 20mg BID (collagenase inhibitor)
L> low dose, instead 100mg
- Anti-inflammatory drugs:
 - NSAIDS
- Bone-sparing drugs:
 - Bisphosphonates *→ osteonecrosis jaw
→ manage perio disease but can use surg / non surg tx*
- Newer agents:
 - Anti-cytokine drugs
 - TNF- α antagonists e.g. Infliximab, Etanercept



CMTs-Chemically Modified Tetracyclines

Evidence-based clinical practice guideline on the nonsurgical treatment of chronic periodontitis by means of scaling and root planing with or without adjuncts

Christopher J. Smiley, DDS; Sharon L. Tracy, PhD;
Elliot Abt, DDS, MSc, MS; Bryan S. Michalowicz,
DDS; Mike T. John, Dr med dent, PhD, MPH; John
Gunsolley, DDS, MS; Charles M. Cobb, DDS, PhD;
Jeffrey Rossmann, DDS, MS; Stephen K. Harrel,
DDS; Jane L. Forrest, EDD; Philippe P. Hujoo, DDS,
MSD, MS, PhD; Kirk W. Noraian, DDS, MS, MBA;
Henry Greenwell, DMD, MSD; Julie Frantsve-
Hawley, PhD; Cameron Estrich, MPH; Nicholas
Hanson, MPH

Clinical relevance scale for interpreting mean differences in clinical attachment level.

CLINICAL ATTACHMENT LEVEL RANGE (MILLIMETERS)	JUDGED CLINICAL RELEVANCE
0-0.2	Zero effect
> 0.2-0.4	Small effect
> 0.4-0.6	Moderate effect
> 0.6	Substantial effect

Balancing level of certainty and net benefit rating to arrive at clinical recommendation strength.

LEVEL OF CERTAINTY	NET BENEFIT RATING		
	Benefits Outweigh Potential Harms	Benefits Balanced With Potential Harms	No Benefits or Potential Harms Outweigh Benefits
High	Strong	In favor	Against
Moderate	In favor	Weak	Against
Low	Expert opinion for or expert opinion against		

Clinical recommendation statements from the American Dental Association Council on Scientific Affairs' Nonsurgical Treatment of Chronic Periodontitis Expert Panel.

 **Strong**

Evidence strongly supports providing this intervention

 **In Favor**

Evidence favors providing this intervention

 **Weak**

Evidence suggests implementing this intervention only after alternatives have been considered

 **Expert Opinion For**

Evidence is lacking; the level of certainty is low. Expert opinion guides this recommendation

 **Expert Opinion Against**

Evidence is lacking; the level of certainty is low. Expert opinion suggests not implementing this intervention

 **Against**

Evidence suggests not implementing this intervention

CLINICAL RECOMMENDATION

SRP* (No Adjuncts)

For patients with chronic periodontitis, clinicians should consider SRP as the initial treatment.

STRENGTH

 **In Favor**

Evidence profile summary.

THERAPY	LEVEL OF CERTAINTY	BENEFIT*	NET BENEFIT RATING
SRP^t (No Adjuncts)			
SRP	Moderate	0.49 (0.36-0.62)	Moderate benefit outweighs potential for adverse effects

Balancing level of certainty and net benefit rating to arrive at clinical recommendation strength.

LEVEL OF CERTAINTY	NET BENEFIT RATING		
	Benefits Outweigh Potential Harms	Benefits Balanced With Potential Harms	No Benefits or Potential Harms Outweigh Benefits
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Clinical recommendation statements from the American Dental Association Council on Scientific Affairs' Nonsurgical Treatment of Chronic Periodontitis Expert Panel.

 Strong	 In Favor	 Weak	 Expert Opinion For	 Expert Opinion Against	 Against
Evidence strongly supports providing this intervention	Evidence favors providing this intervention	Evidence suggests implementing this intervention only after alternatives have been considered	Evidence is lacking; the level of certainty is low. Expert opinion guides this recommendation	Evidence is lacking; the level of certainty is low. Expert opinion suggests not implementing this intervention	Evidence suggests not implementing this intervention

CLINICAL RECOMMENDATION

STRENGTH

SRP With Systemic Antimicrobials

For patients with moderate to severe chronic periodontitis, clinicians may consider systemic antimicrobials as an adjunct to SRP, with a small net benefit expected.

• Weak

Evidence profile summary.

THERAPY	LEVEL OF CERTAINTY	BENEFIT*	NET BENEFIT RATING
SRP and systemic antimicrobials	Moderate	0.35 (0.20-0.51)	Balance between small benefit and potential adverse effects

Clinical recommendation statements from the American Dental Association Council on Scientific Affairs' Nonsurgical Treatment of Chronic Periodontitis Expert Panel.

 Strong

Evidence strongly supports providing this intervention

 In Favor

Evidence favors providing this intervention

 Weak

Evidence suggests implementing this intervention only after alternatives have been considered

 Expert Opinion For

Evidence is lacking; the level of certainty is low. Expert opinion guides this recommendation

 Expert Opinion Against

Evidence is lacking; the level of certainty is low. Expert opinion suggests not implementing this intervention

 Against

Evidence suggests not implementing this intervention

CLINICAL RECOMMENDATION

STRENGTH

SRP With Locally Delivered Antimicrobials

For patients with moderate to severe chronic periodontitis, clinicians may consider **locally delivered chlorhexidine chips** as an adjunct to SRP, with a moderate net benefit expected.

• Weak

For patients with moderate to severe chronic periodontitis, clinicians may consider **locally delivered doxycycline hydiate gel** as an adjunct to SRP, but the net benefit is uncertain.

• Expert Opinion For

For patients with moderate to severe chronic periodontitis, clinicians may consider **locally delivered minocycline microspheres** as an adjunct to SRP, but the net benefit is uncertain.

• Expert Opinion For

Evidence profile summary.

THERAPY	LEVEL OF CERTAINTY	BENEFIT*	NET BENEFIT RATING
SRP and chlorhexidine chips	Moderate	0.40 (0.24-0.56)	Balance between moderate benefit and potential adverse effects
SRP and doxycycline hydiate gel	Low	0.64 (0.00-1.28)	Uncertainty in the balance between benefits and adverse effects because benefits are unclear
SRP and minocycline microspheres	Low	0.24 (-0.06 to 0.55)	Uncertainty in the balance between benefits and adverse effects because benefits are unclear

rarely see chips

Case selection central

Balancing level of certainty and net benefit rating to arrive at clinical recommendation strength.

LEVEL OF CERTAINTY	NET BENEFIT RATING		
	Benefits Outweigh Potential Harms	Benefits Balanced With Potential Harms	No Benefits or Potential Harms Outweigh Benefits
High	Strong	In favor	Against
Moderate	In favor	Weak	Against
Low	Expert opinion for or expert opinion against		

Clinical recommendation statements from the American Dental Association Council on Scientific Affairs' Nonsurgical Treatment of Chronic Periodontitis Expert Panel.

 Strong	 In Favor	 Weak	 Expert Opinion For	 Expert Opinion Against	 Against
Evidence strongly supports providing this intervention	Evidence favors providing this intervention	Evidence suggests implementing this intervention only after alternatives have been considered	Evidence is lacking; the level of certainty is low. Expert opinion guides this recommendation	Evidence is lacking; the level of certainty is low. Expert opinion suggests not implementing this intervention	Evidence suggests not implementing this intervention

CLINICAL RECOMMENDATION

STRENGTH

SRP With Systemic Subantimicrobial-dose Doxycycline

For patients with moderate to severe chronic periodontitis, clinicians may consider systemic subantimicrobial-dose doxycycline (20 milligrams twice a day) for 3 to 9 months as an adjunct to SRP, with a small net benefit expected.

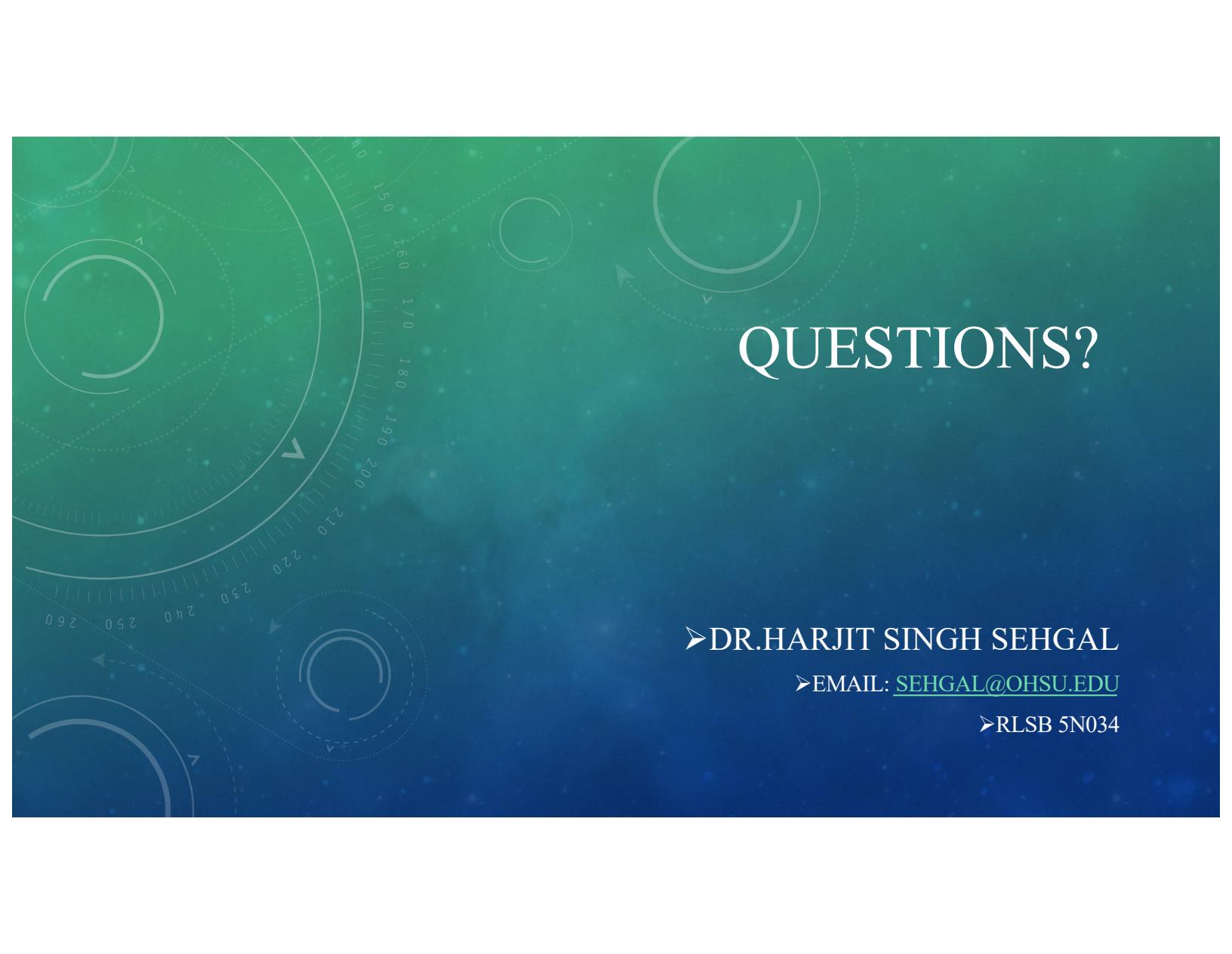
• In Favor

Evidence profile summary.

THERAPY	LEVEL OF CERTAINTY	BENEFIT*	NET BENEFIT RATING
SRP With Adjuncts			
SRP and systemic SDD‡	Moderate	0.35 (0.15-0.56)	Small benefit outweighs potential for adverse effects

TAKE HOME MESSAGE

- Scaling and Root Planing is the treatment of choice for periodontitis as the initial therapy.
- There is only a slight benefit with adjunctive use of systemic and local antimicrobials with SRP.
- Adjunctive antimicrobials or host-modulation therapy can be considered for
 - Severe periodontitis
 - Medically compromised patients – smokers, uncontrolled diabetics
 - Atypical forms of periodontitis (Periodontal abscesses, Periodontitis with a distinct incisor-molar pattern in young patients –previously aggressive periodontitis)



QUESTIONS?

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