

### Contemporary Periodontal Flap Surgery for the Modern Day Dental Practice

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### What are the Objectives of Periodontal Surgery?

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#### Objectives of Periodontal Surgery

- Adjunctive to cause related therapy
- Facilitate removal of subgingival deposits
- Enhance long term preservation of the periodontium
- Improved access for instrumentation
- Create more physiologic soft and hard tissue morphology

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#### Objectives of Periodontal Surgery

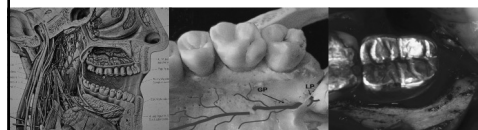
- Regeneration
- Resolve mucogingival abnormalities
- Preparation for orthodontic, restorative, prosthodontic and implant therapy
- Esthetics

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### Guidelines for Periodontal Surgery

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### Know Head and Neck Anatomy!!



MANDATORY to have good knowledge of head & neck anatomy;  
e.g., Friedman - Head and Neck Anatomy; Gray - Gray's Anatomy

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- The aim of periodontal treatment is to establish a healthy dentition which provides correct form, function and esthetics
- Periodontal treatment includes initial non-surgical therapy followed by a re-evaluation and a decision to continue with maintenance therapy or proceed with surgical treatment

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- The periodontal flap is defined in the literature as a section of gingiva and/or mucosa surgically separated from the underlying tissues to provide visibility of and access to bone and root surfaces (Carranza's Clinical Periodontology)
- Periodontal flap is defined as the separation of a section of tissue from the surrounding tissue except at its base (Glossary of Periodontal Terms)

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#### Requirements:

##### Must be preceded by Initial Therapy:

- Following Re-evaluation
  - Often surgery not necessary any longer
  - Patient must be motivated
  - Exhibit excellent plaque control
  - Minimal inflammation

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#### What are the Surgical Considerations?:

- Selection of the appropriate procedure is based upon:
  - Simple or complex
  - Predictability
  - Efficiency
  - Muco-gingival considerations
  - Anatomic and physical limitations
  - Age and systemic health

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#### What are the Objectives of Flap Surgery?:

- Improve access to roots and alveolar bone:
  - Enhance visibility
  - More effective SRP
  - Reduce tissue trauma
- Correct osseous defects
  - Establish physiologic architecture of hard tissues
  - Improve physiologic contours of the soft tissue

Newman and Carranza's Clinical Periodontology 13<sup>th</sup> Edition

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#### What are the Objectives of Flap Surgery?:

- Repair or regeneration of the periodontium
- Pocket reduction
  - Improve homecare maintenance and for hygienist
  - Long term stability
- Improve soft tissue contours
  - Better plaque control and maintenance
  - Improve esthetics

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**What are the Indications for Periodontal Surgery?:**

- Areas inaccessible to root planning and scaling: e.g., furcations and root concavities
- Deep periodontal pockets: > 4 mm (limited efficacy to remove deposits without surgical access)

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**Pocket Reduction Surgery:**

- Resective surgery: gingivectomy, apically positioned and repositioned flap with or without osseous resection
- Open Debridement: Access surgery, e.g., MWF
- Regenerative surgery: grafts and membranes

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**What are the Factors Affecting Flap Design ?:**

- Necessary access to underlying bone and root surfaces
- Final flap position, e.g., repositioned or positioned (apically)
- Preservation of adequate blood supply to the flap

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**What are the Two Basic Flap Designs ?:**

- Conventional flap
- Papilla preservation flap

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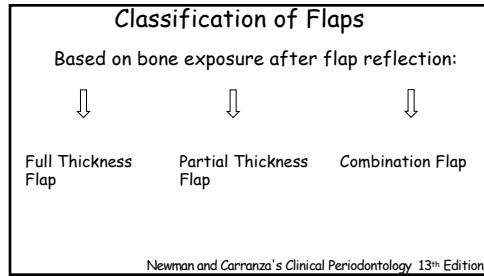
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<b>Incisions</b>		
Incision	Description	Indication
External Bevel	Coronally Directed	External bevel gingivectomy, crown lengthening, gingivoplasty
Internal Bevel	Apically directed, positioned at the crest of the gingival margin or 0.5 to 2.0 mm from the margin	Modified Widman Flap and crown lengthening

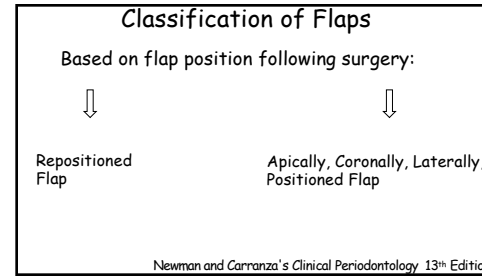
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<b>Incisions</b>		
Incision	Description	Indication
Sulcular	Apically Directed	Internal bevel gingivectomy, crown lengthening

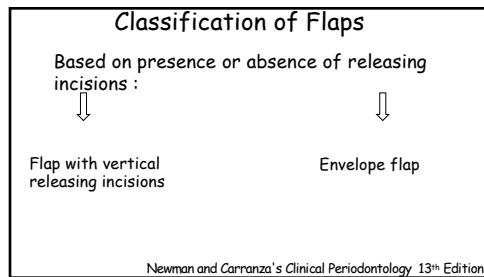
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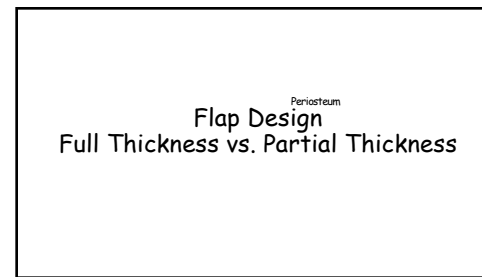
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What are the Different Types of Incisions?

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**Types of Incisions:**  
\*#15c or 15 scalpel blade

**A Internal Bevel Incision:**  
starts away from the gingival margin and is directed at the bone crest

**B Crevicular/Sulcular Incision:**  
starts at the bottom of the pocket and is directed at the bone crest

**C Horizontal/Interdental incision:**  
is performed following flap reflection

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What Determines the Placement of the 1° Incision?

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- Primary incision of flap surgery (leaving minimum of 3mm of keratinized tissue)
- Need access to correct bone defects using osteoplasty/osteotomy techniques
- Deep periodontal pockets (repair or regeneration)
- Clinical crown lengthening

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What Determines the Sulcular or Crevicular Incision?

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What are the Indications for Sulcular or Crevicular Incisions?

- Narrow band of KT
- Shallow pocket
- Esthetic concerns in the maxillary anterior sextant
- 2° incision in conventional flap surgery
- GTR or GBR

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What Determines the Placement of the 3° Incision?

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Periodontal Dressing/Pack

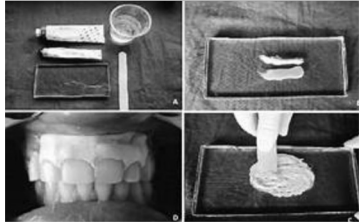
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**Periodontal Pack/Dressing:**

- Protective material placed over the surgical site
- Acts like a "bandage"
- Protects against food particles
- Coe-Pak™ is a metallic oxide (ZnO) and fatty acid (non-ionized carboxylic acid)
- Mechanical retention by interlocking interproximal spaces

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Equal lengths of the two pastes on a paper pad



Mix with tongue depressor for 2-3 minutes

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Lubricate fingers (Vaseline™) and roll between fingers



Patient instructed to STAY AWAY from pack/dressing except mouthrinse and remove after one week

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**How Does a Periodontal Flap Heal?**

- 0 - 24 hours: blood clot formation (PMN's, erythrocytes, injured cells and capillaries)
- 1 - 3 days: early re-organization of the blood clot, epithelial cells begin to migrate over the border of the flap
- 1 week: granulation tissue originating from the gingival CT, bone marrow and periodontal ligament replaces the blood clot

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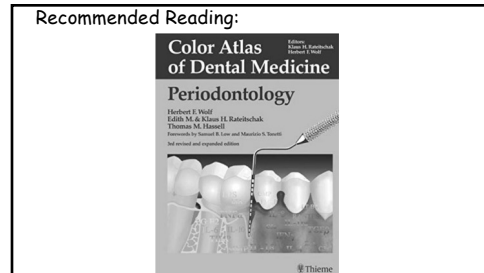
**How Does a Periodontal Flap Heal?**

- 2 weeks: collagen fibers begin to line up parallel to the root surface establishing a weak link between the flap and tooth surface
- 1 month: epithelialized gingival sulcus and well defined epithelial attachment, early functional arrangement of the supra crestal fiber groups

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**Open Flap Debridement**

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### Modified Widman Flap

#### What are the Goals of the MWF?

- Optimum mechanical subgingival root planning and decontamination with direct vision
- Healing by primary intention
- No ostectomy is performed however minor osteoplasty can be performed to improve the facial and/or lingual morphology primarily to achieve the desired interdental defect closure

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### Modified Widman Flap

#### Indications for the MWF?

- For the treatment of all types of periodontitis but especially effective with pocket depths of 5-7 mm
- Dependant on the pathomorphologic situation on the individual teeth, the MWF may be combined with larger and fully reflected flaps and special procedures such as mesial or distal wedge, root resection, hemi-section and osseous grafting

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### Modified Widman Flap

#### Contraindications for the MWF?

- Lack of or very thin attached keratinized tissue, i.e., thin biotype/genotype since it does not permit the initial scalloped incision (internal bevel) therefore may need to employ an intrasulcular incision or increase the zone of keratinized attached tissue, i.e., gingival graft
- Osseous surgery (ostectomy and osteoplasty) in the presence of deep osseous defects, irregular bone contours and an APF is planned

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### Osseous Surgery: Osteoplasty/Ostectomy

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### Principles of Osseous Surgery

- Purpose
  - Pocket reduction
    - Reduce microbial habitat
  - Re-establish favorable osseous morphology
    - Remove bone ledges
    - Remove exostoses
    - Re-festoon interdental area

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## Guided Tissue Regeneration (GTR)

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## Regeneration Prerequisites

- Biocompatible root surface
  - Excellent OH
- Multi-walled bone defect
  - Four-walled (socket) vs One-walled
- Presence of precursor (osteogenic) cells
- Exclusion of epithelium
- Exclusion of gingival CT
- Stabilization of wound

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## Purpose of Regeneration

- Pocket reduction
  - Not by resection of bone...BUT...
  - Thru regeneration of a new attachment apparatus
    - New cementum
    - New PDL
    - New bone
- Current results of regenerative surgery
  - Results can be inconsistent
  - At best, 100% success is unpredictable

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## Guided Tissue Regeneration Principle

- Placement of Membrane
  - Prevents epithelial down-growth
- Barrier to exclude epithelial cells
- Barrier to exclude gingival fibroblast
  - Extends time for mobilization
    - Fibroblast from PDL
    - Osteoblast
  - Healing from base > coronally

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## Restorative or (Functional) Crown Lengthening

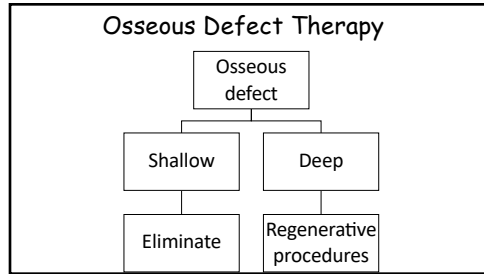
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## Hemostasis

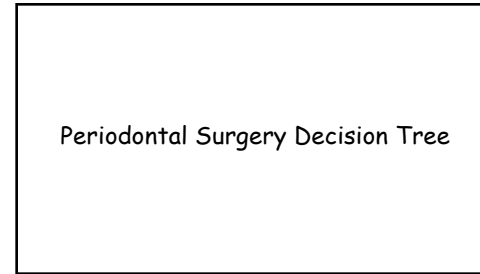
- ALWAYS take blood pressure and heart rate pre-surgery
- Use vasoconstrictor
- Make definitive incisions
- Complete debridement
- Copious irrigation
- Medications associated with bleeding? e.g., anticoagulants

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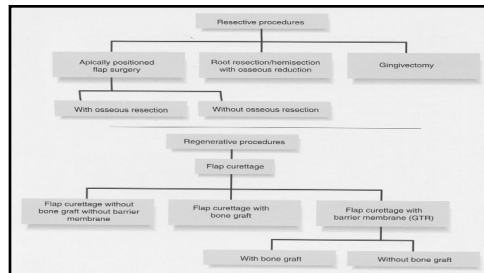




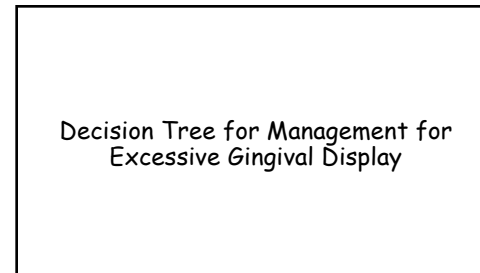
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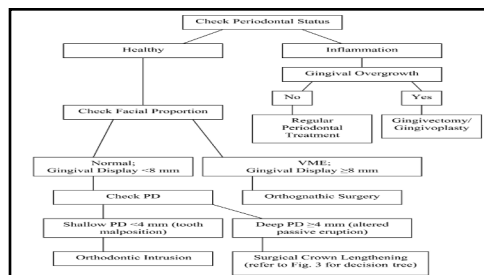
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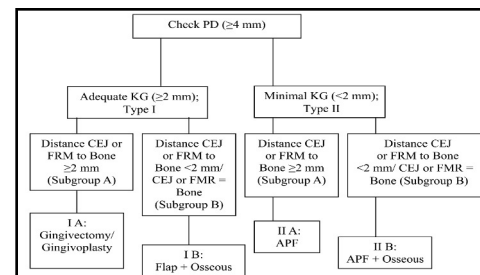
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## Comparison Between Esthetic and Restorative (or Functional) CL Surgery

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Factors to Consider	Esthetic	Restorative and Functional
Goal	To create an aesthetic, wide low and midline SW around the teeth (2 to 3 mm)	To maintain periodontal health and midline low around the teeth (2 to 3 mm)
Reference line	CEJ	FM
Techniques	1 cut min KID A. Gingivectomy/Gingivoplasty B. Flip + Osseous	Gingivectomy/Gingivoplasty APF + Osseous Orthodontic forced eruption
	4 L-3 min KID A. APF B. APF + Osseous	
Incision	Basal only	Basal and parallel/angul
	CEJ 2/3 min KID and follow aesthetic smile design	Follow APF concept (near 2/3 min KID behind)
	No vertical releasing incision	Usually done in vertical release to apically position flap
Surgical intent	Often needed	Not needed due periodontal control
Flap raised	Basal only (no release of interdental papilla/parallel flap)	Basal and parallel/angul
Osseous surgery	Follow CEJ or aesthetic smile line (usually raised 2 to 3 mm below CEJ)	Follow APF (parallel) (near 1/3 min below FM)
Osseous surgery location	Only basal side (not including an interproximal area)	Both sides including interproximal area
Flap flap position	Located at CEJ or slightly above CEJ	Located at base crest
Recommended suture technique	Horizontal positional	Corrosion string/vertical mattress
Wound dressing	Not necessary	Often required
Healing period	Soft tissue only (i.e., gingivectomy/gingivoplasty), 4 to 6 weeks Bone removed (i.e., flap raised), 8 to 12 weeks Bone removed (i.e., osseous surgery), 6 months	Often 6 weeks because bone needs to be removed to recreate the SW
Secondary surgery	Often needed Refractive/orthodontic	Not necessary (can redistribution to make up the difference) Refractive/orthodontic, bone contouring/grafting

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