

قَالُوا سُبْحَانَكَ لَا عِلْمَ لَنَا  
إِلَّا مَا عَلَمْتَنَا  
إِنَّكَ أَنْتَ الْعَلِيمُ الْحَكِيمُ

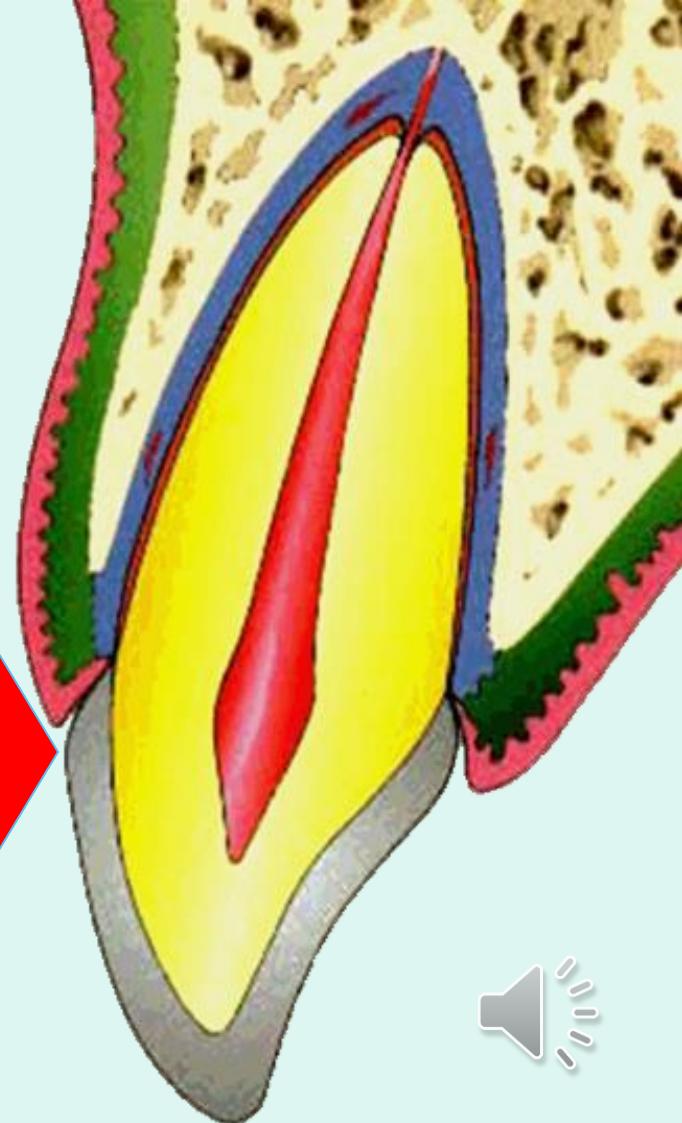
# **Facial Bone Fractures**

**Dr. Hisham Y. El Batawi BDS. MDS. PhD.**



# **Have you noticed from previous lectures that ....**

**Energy can not be  
created nor  
destroyed.**



**The energy within the impact should be consumed in a  
way or another!!!**

For any structure to resist trauma, it should be resistant in its....

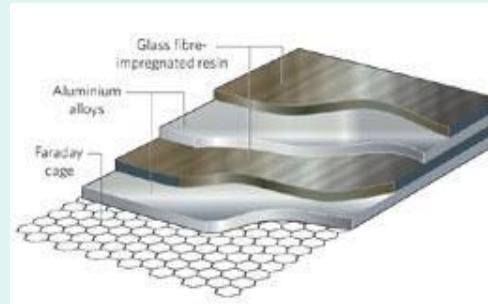
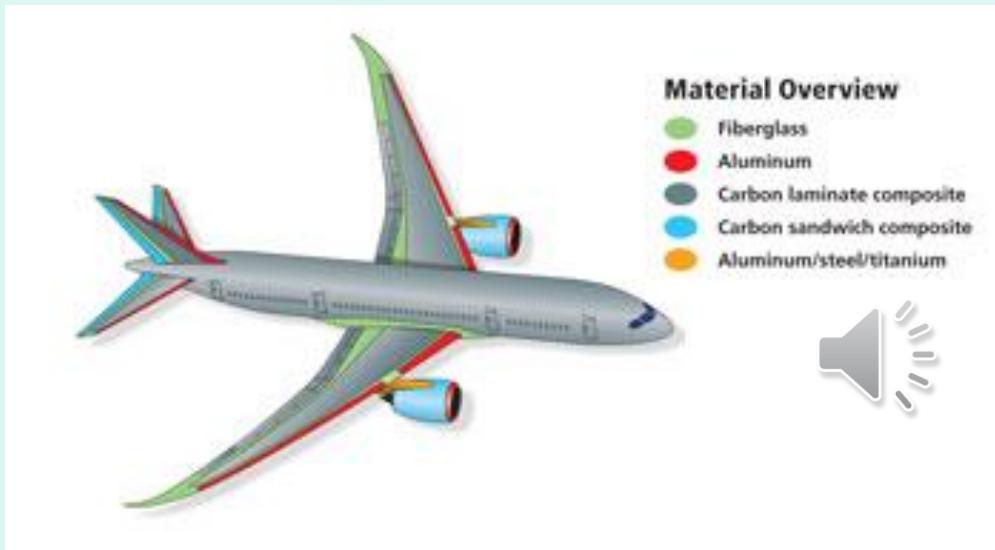
1. microstructure

and in its

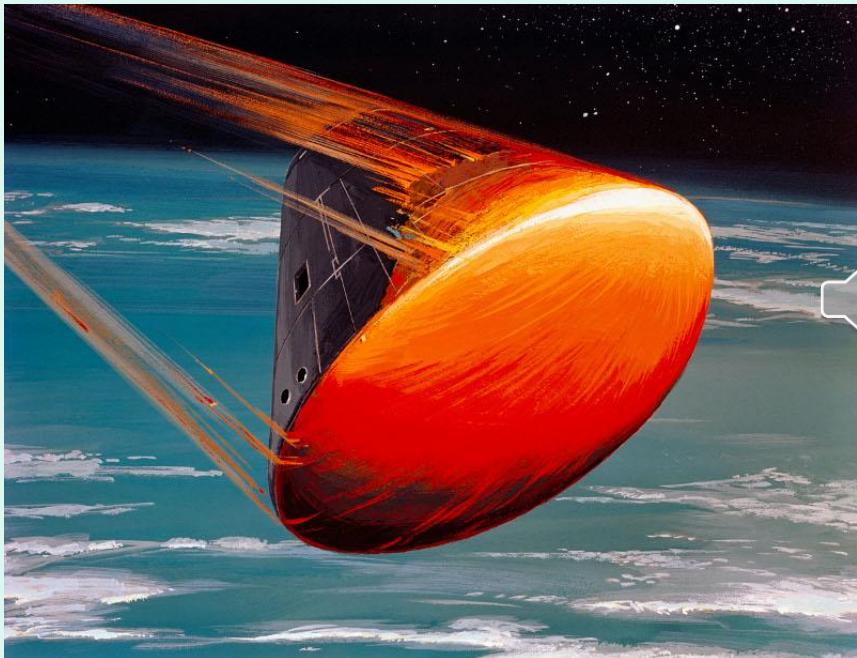
2. design.



# Remember our first meeting???



Remember our Lecture on avulsion when we visited the aviation museum in Washington???

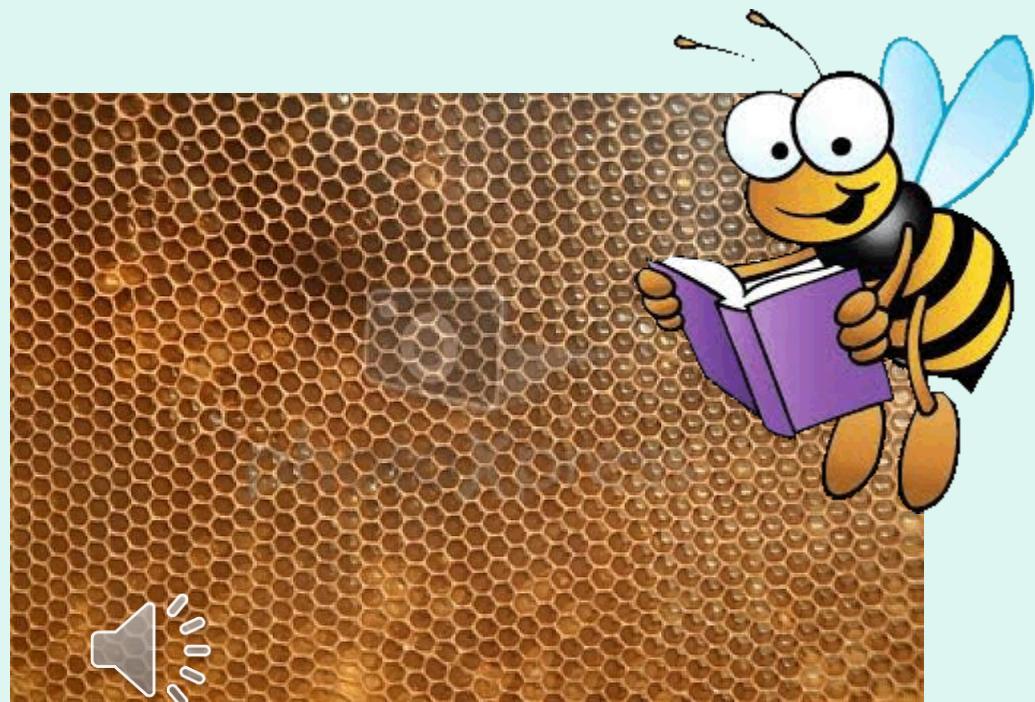


1. Light weight with....
2. maximum compressive strength

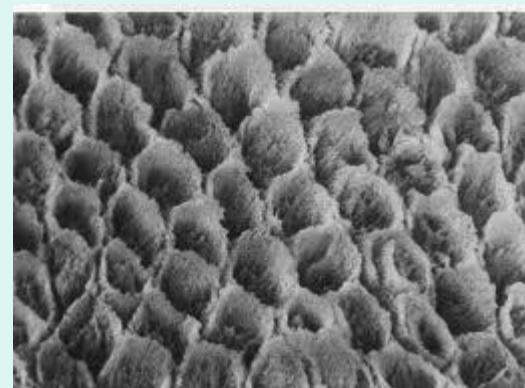
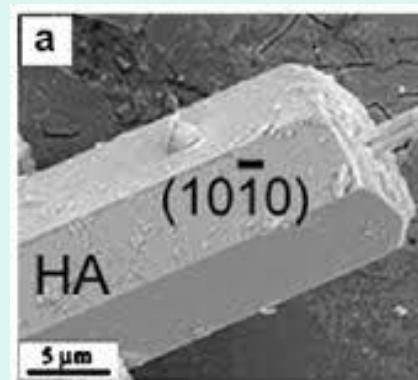
The heat shield of Apollo 11

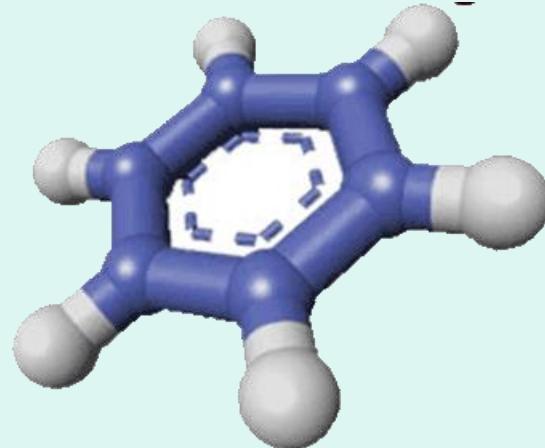
## Secrets of the HEXAGON

Bees have the knowledge  
that Hexagonal designs use  
the least amount of matter  
and provide maximum  
strength !!!!



Building blocks of human  
hard tissue is formed of  
Hexagonal Hydroxyapatite  
crystals arranged in  
Hexagonal enamel rods.





This arrangement and design insures the least consumption of matter with the strongest resistance to trauma

# Fussen Bavaria, Germany

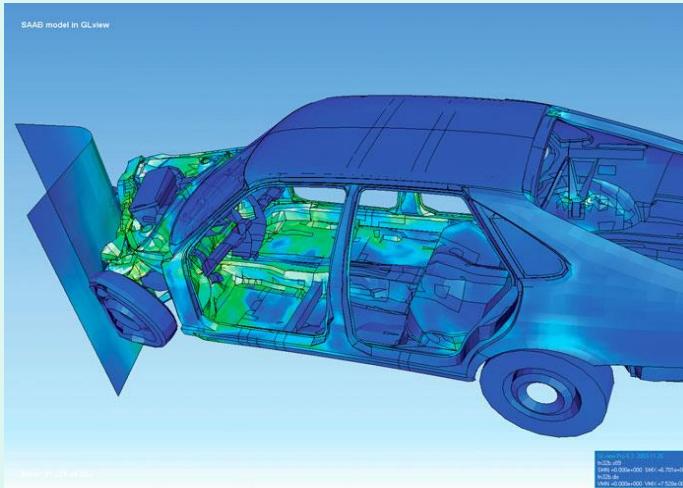


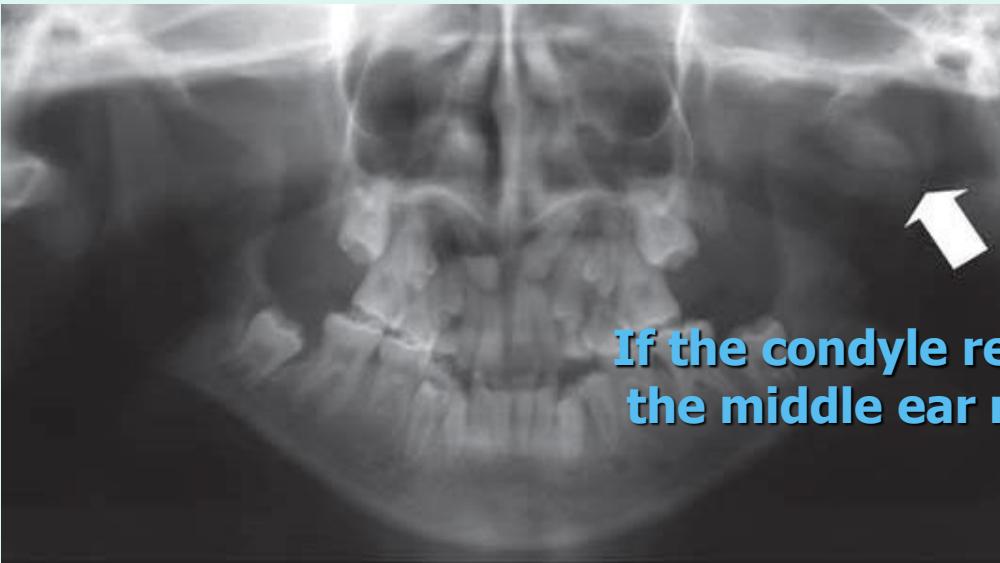
**The Germans live on one of the most beautiful spots on earth, no wonder they Produce beautiful designs and amazingly engineered structures.**

# They designed “Crumple Zones”.



**Crumple zones are areas in a vehicle's body that intentionally bend and break to consume and deflect impact energy away from passenger compartment.**



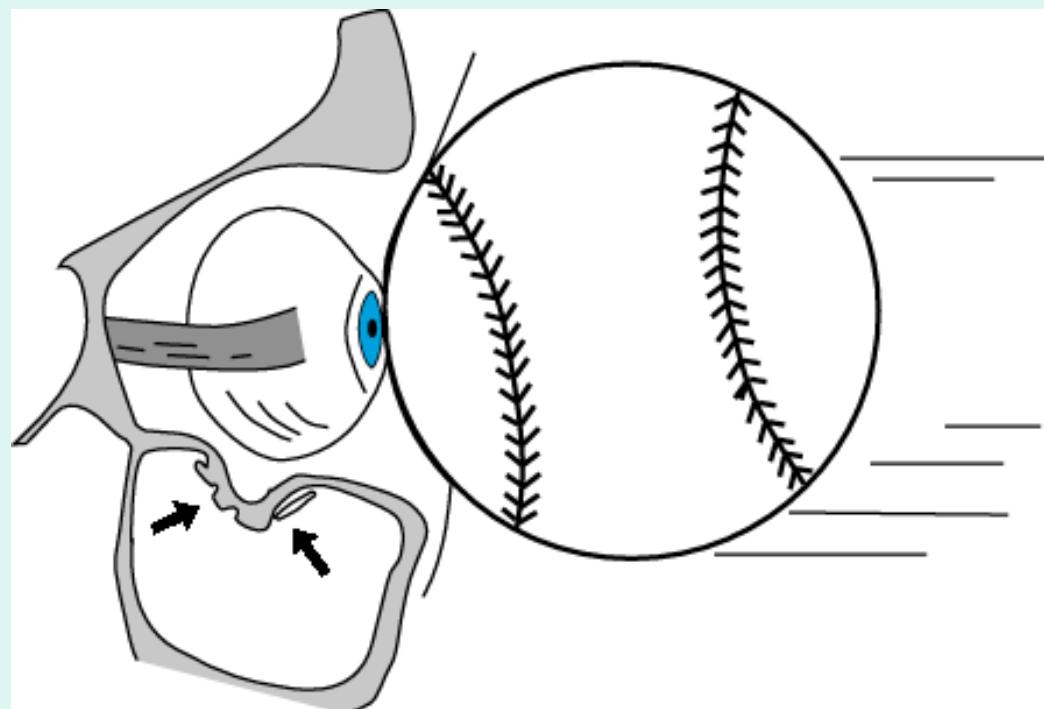


If the condyle resists breakage  
the middle ear may suffer

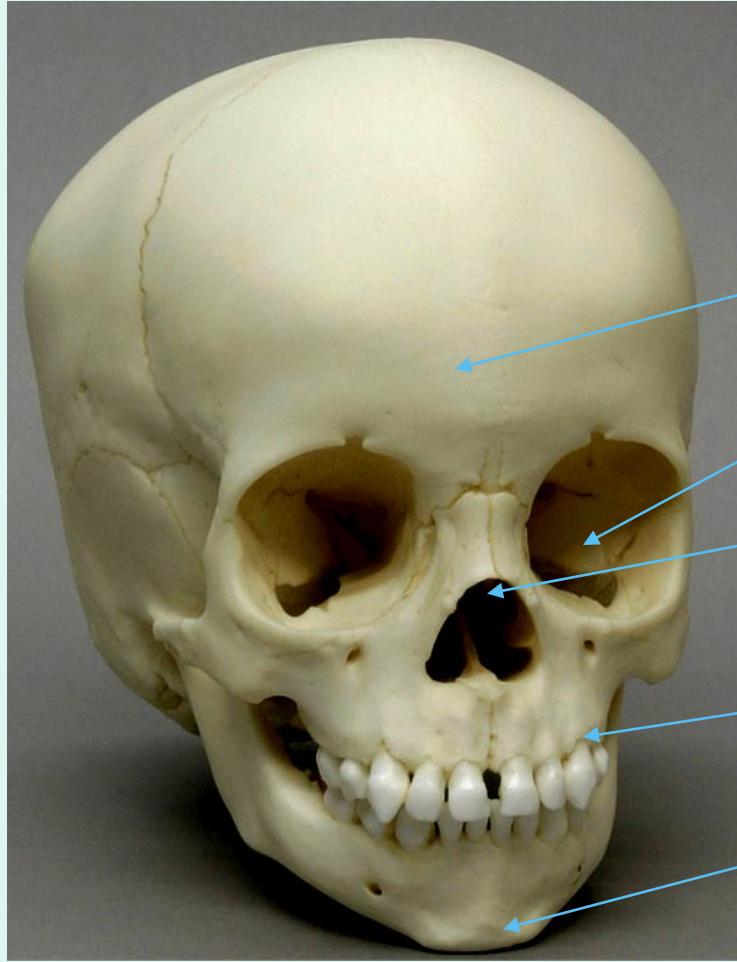
God blessed us with crumple zones



Orbital bones are designed  
To absorb the impact and  
break away from the eye  
ball i.e broken specules go  
to sinus direction  
and not to orbital cavity



# Skull's "*Crumple zones*"



Frontal 5.1%

Orbital 9.5%

Nasal 58.6%

Mid facial Maxillary 3.8%

Mandibular 21.5%

Complex 1.5%

Skull crumple zones are areas in the skull that break to consume and deflect impact energy away from vital organs.

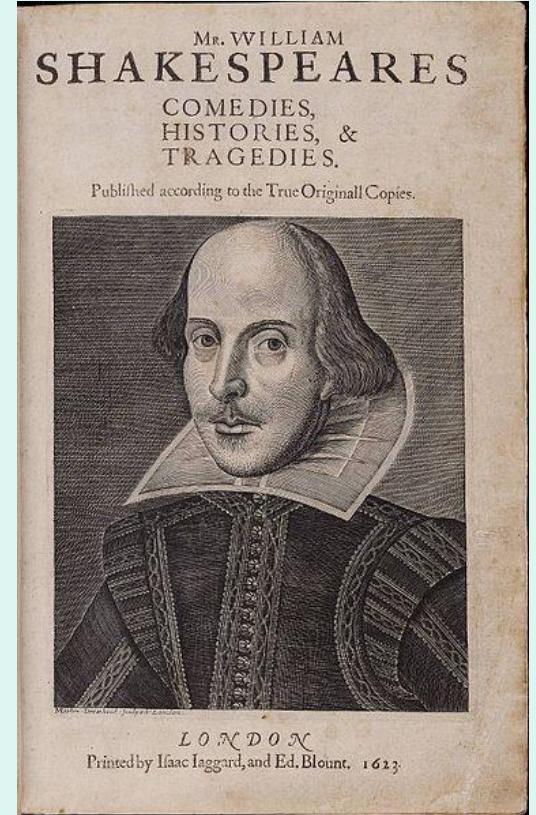
# Epidemiology

- The overall frequency of facial fractures in children is much lower than that in adults. Approximately 5%–15% of all facial fractures occur in children.
- The prevalence of pediatric facial fractures is lowest in infants and increases progressively with age...Why? 
- Two peaks are observed in children's facial fractures 6-7 years and 12-14 years....Why?
- Incidence in boys double that of girls...Why?

God has given you one face,  
and you make yourself another.

“William Shakespeare”

William Shakespeare

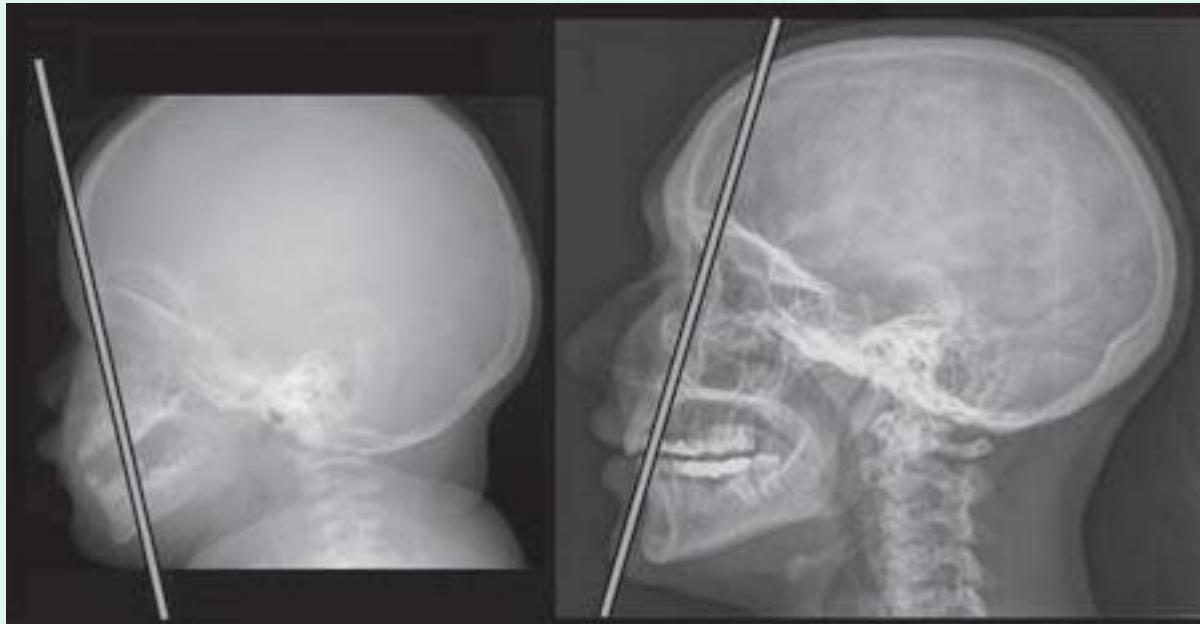


# Shakespeare is right, we're changing the face god gave us through our negligence

- RTA including bicycles.
- Sports-related injuries.
- Fall
- Violence.
- Abuse. Suspect it when you see a mal union.



Children are not just small sized adults.



- Cranium /Face ratio. 8/1 at birth, 2.5/1 for adults.
- Extent of para nasal sinuses.
- Type of bone and soft tissue.
- Dental development.



# Accordingly, children have . . .



What is green stick fracture?

- Less chance for facial fractures.
- More susceptibility to “green stick” fracture.
- More susceptibility to cranial injury.



Green stick fracture

# Maxillary Fracture “clinical picture”

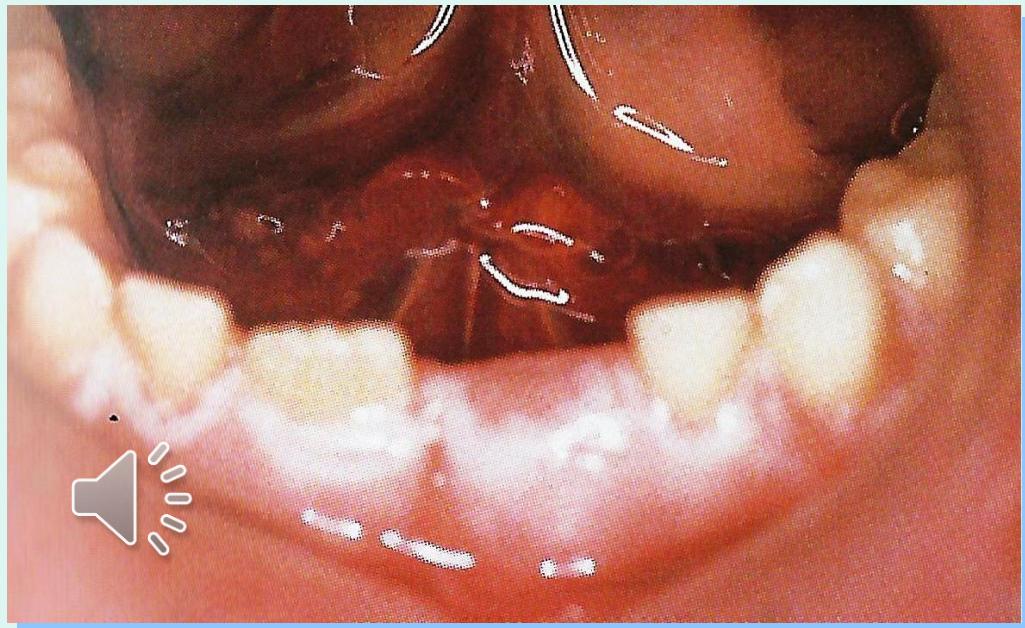


- Facial swelling.
- Peri orbital emphysema.
- Peri orbital ecchymosis.
- Diplopia.
- Midface mobility.
- Paraesthesia
- Occlusal disturbance.
- CSF epistaxis. (*Don't touch the patient and call for a neurologist*).



# Mandibular Fracture “clinical picture”

- Facial swelling.
- Trismus.
- Occlusal disturbance.
- Chin asymmetry.
- Sublingual ecchymosis.



# Limitations of radiographic imaging in children

- Incompletely calcified bone with underdeveloped cortical plates.
- Numerous tooth buds undergoing development may mask injured areas.
- Small nasal sinuses.
- Green stick fractures are hard to recognize due to lack of bone displacement.
- Questionable child cooperation.

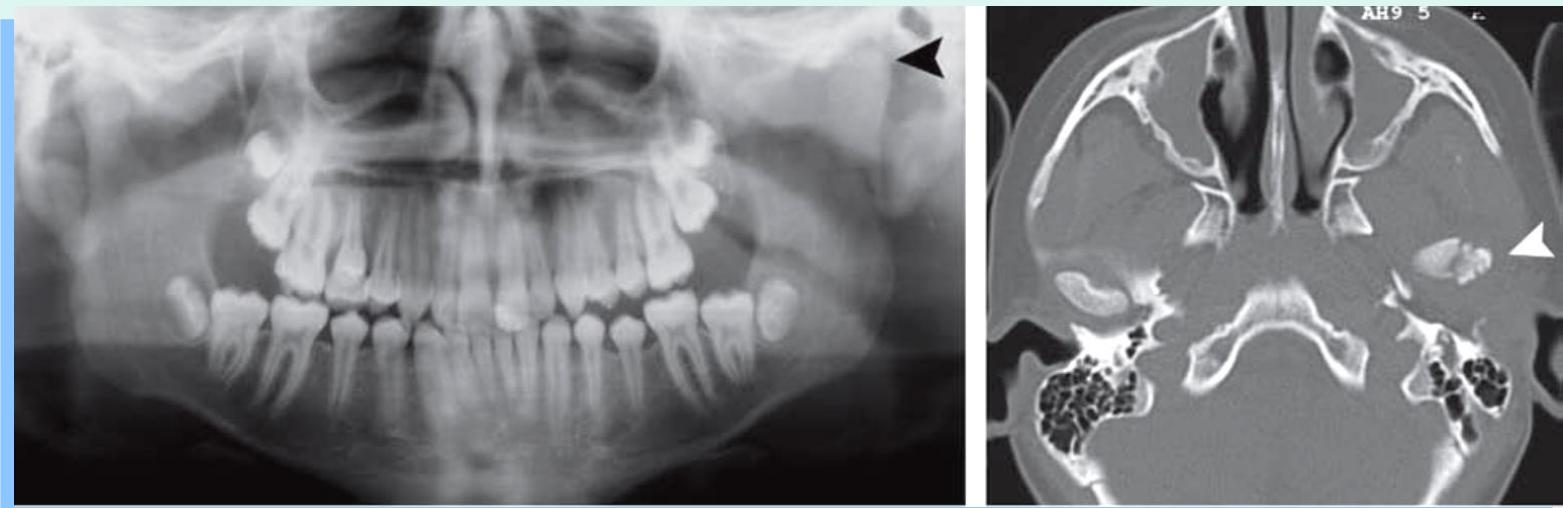
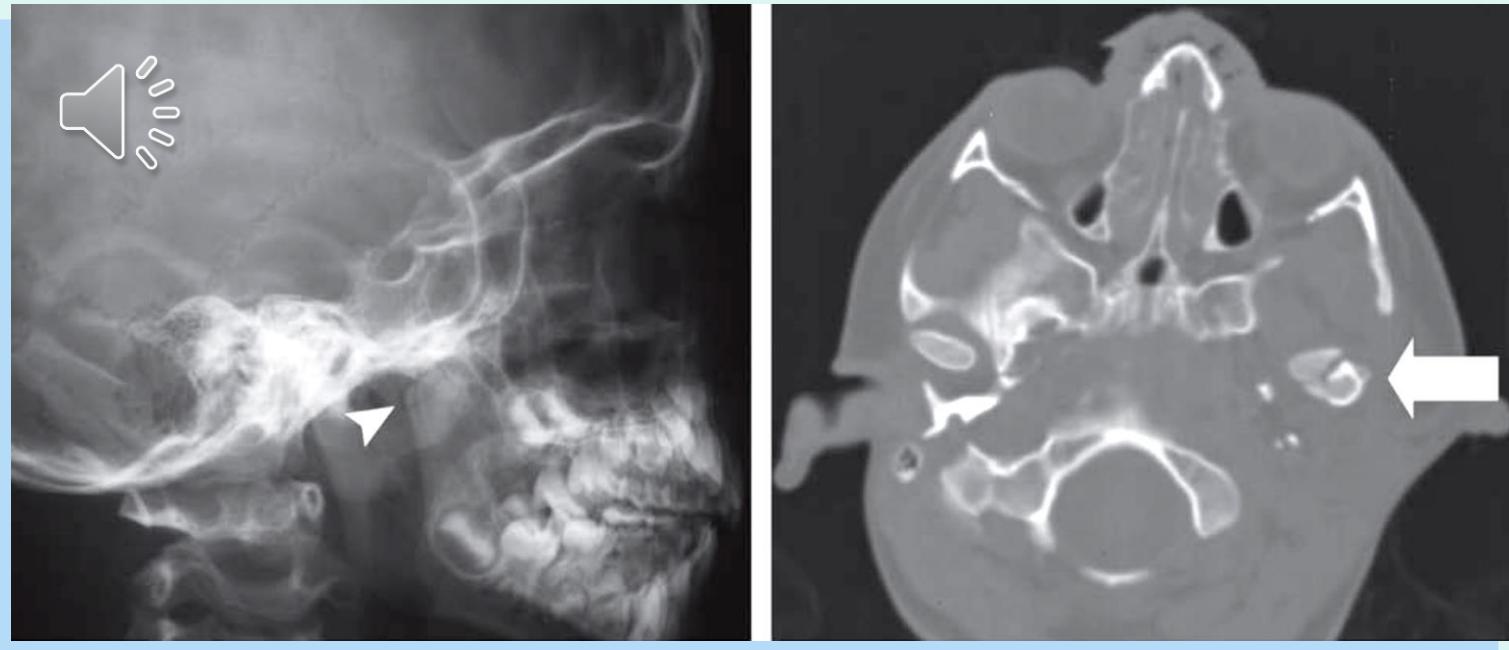


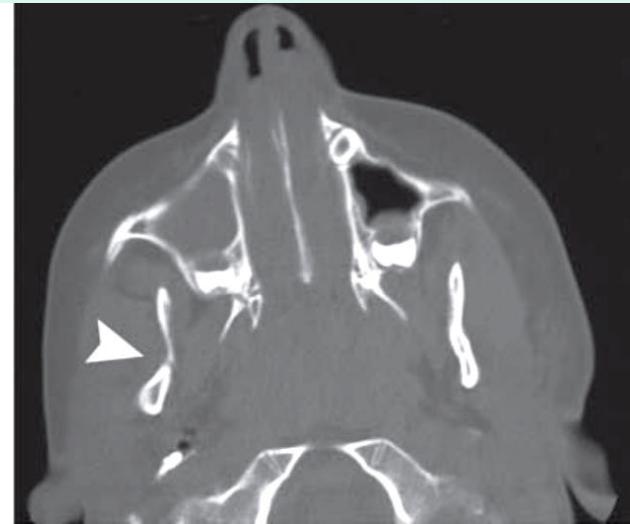
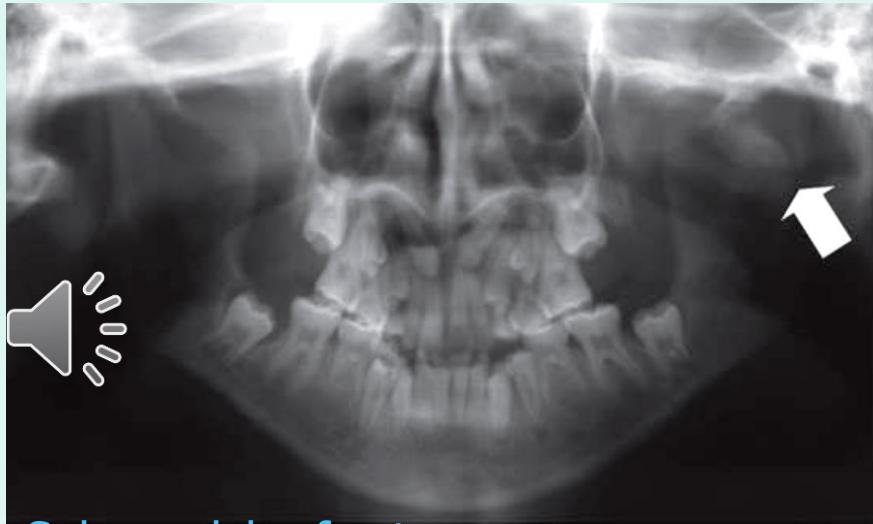
# Helpful economic tip before going to expensive CT and 3D imaging.



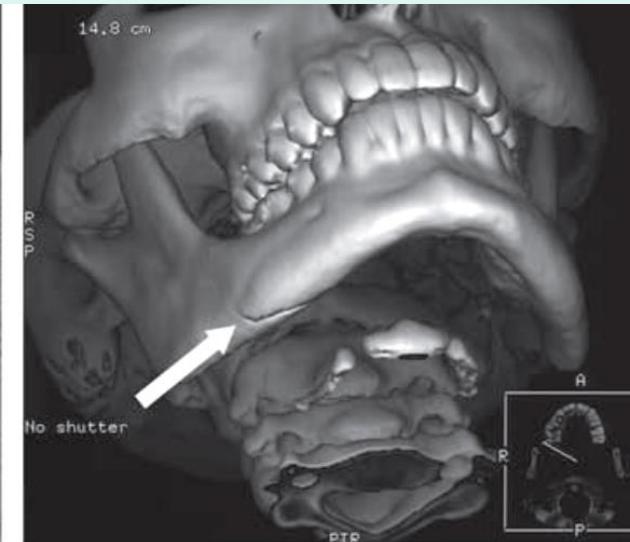
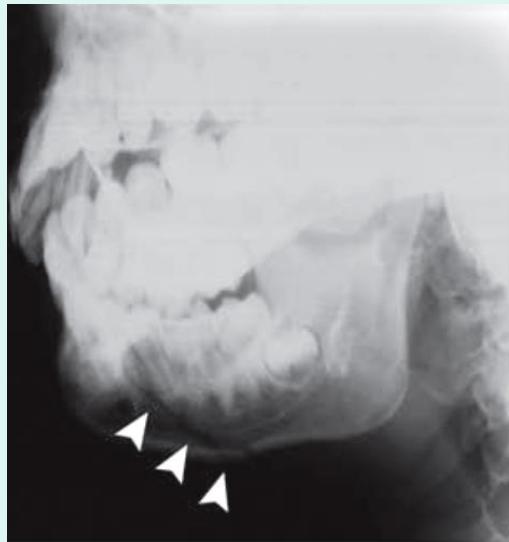
Ask the patient to break  
the tongue depressor

# Mandibular fracture “look at the condyles”



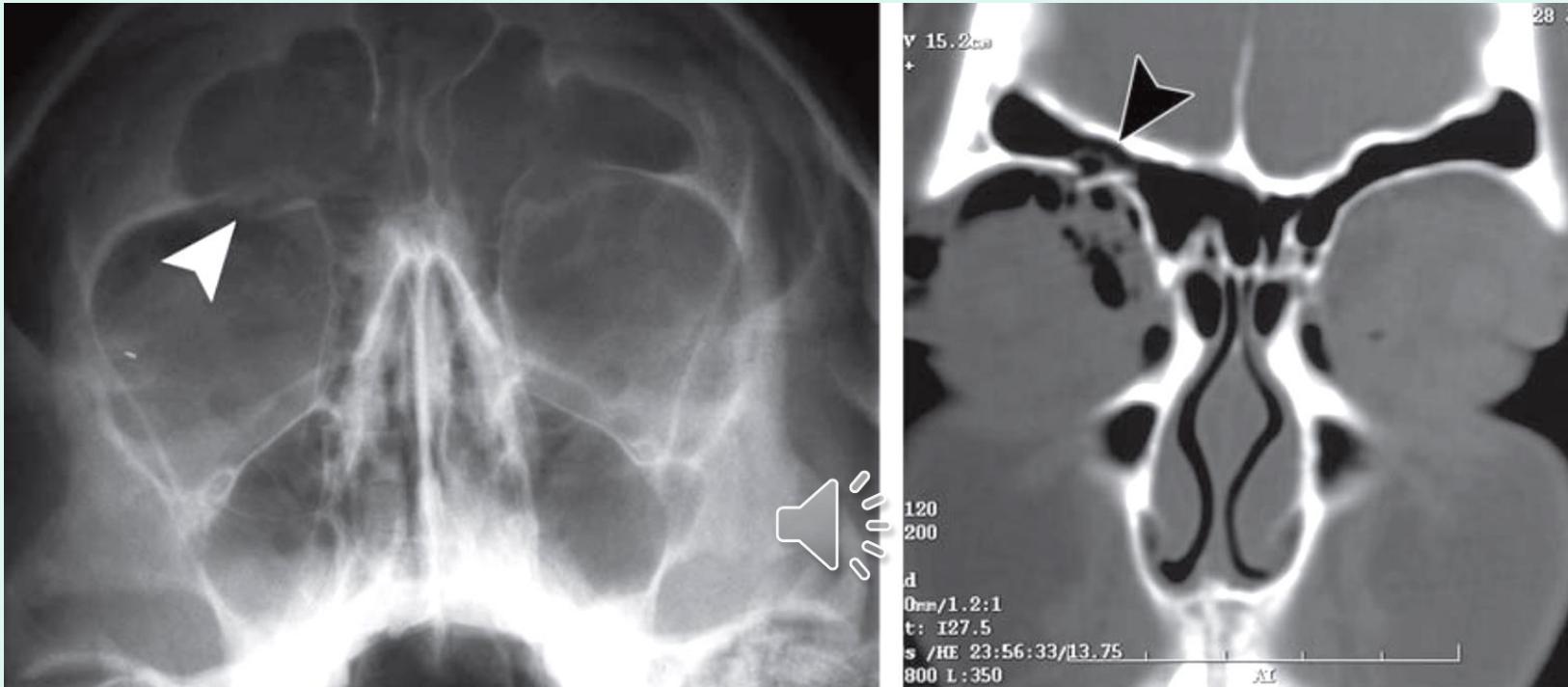


Sub condylar fracture.

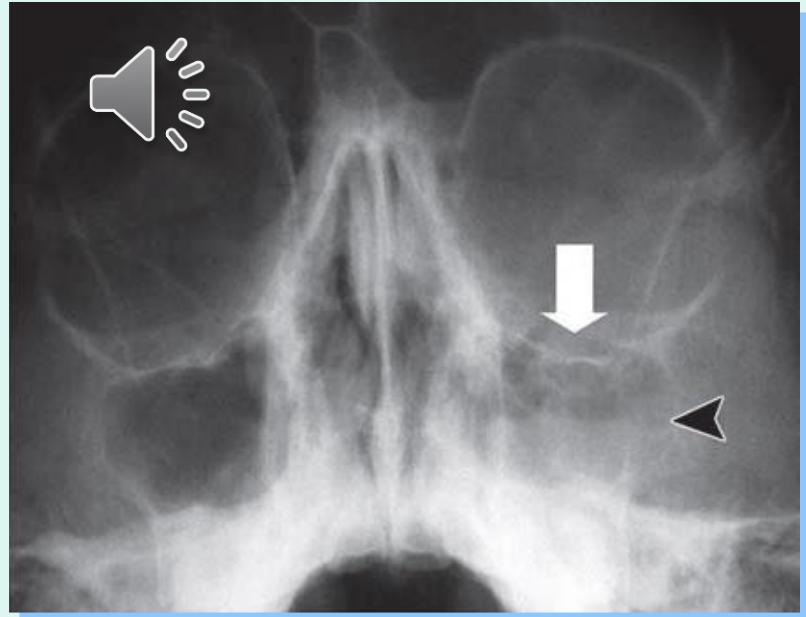


Inf. border fracture.

# Orbital roof fracture



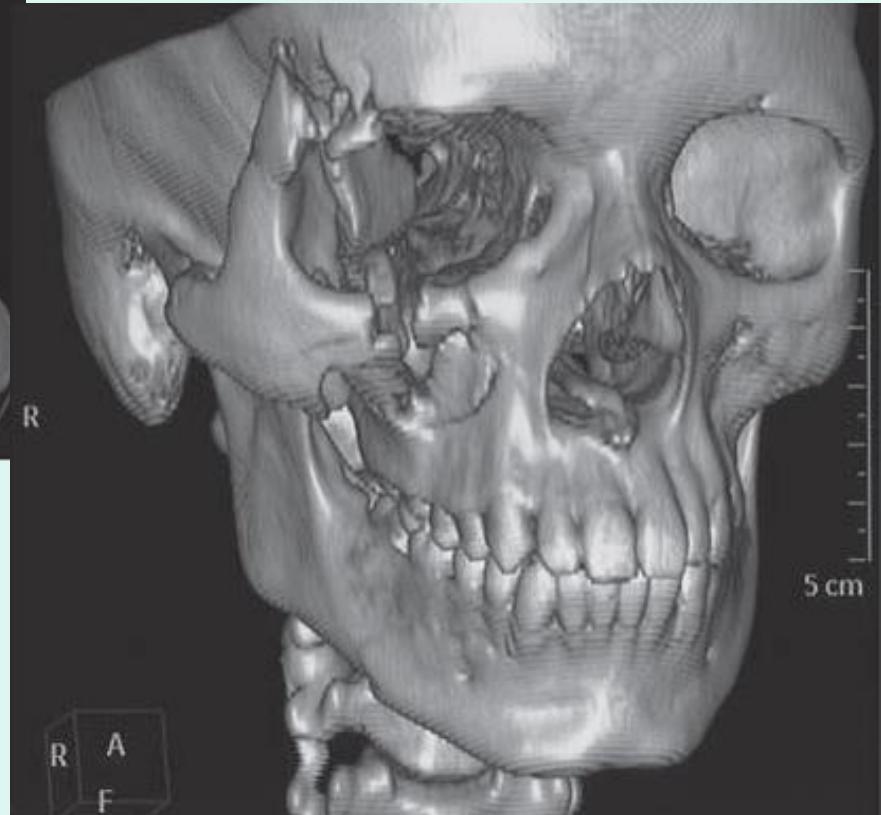
# Orbital floor



Ask the child to look up!,  
part of  
the eye muscle is “trapped”  
inside the  
Maxillary sinus.



# Maxillary and Zygomatic Fractures



# Management

- **Conservative**
- **Reduction (closed reduction)**
- **Intermaxillary fixation (IMF)**
- **Osteosynthesis (open reduction)**



What 's the difference between closed and open reduction?



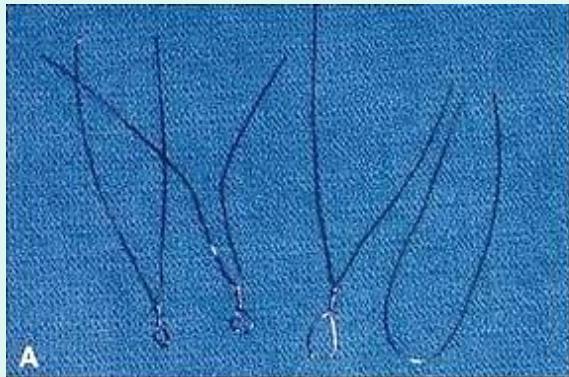
Open reduction



Ivy loop



# How to make IVY loops?

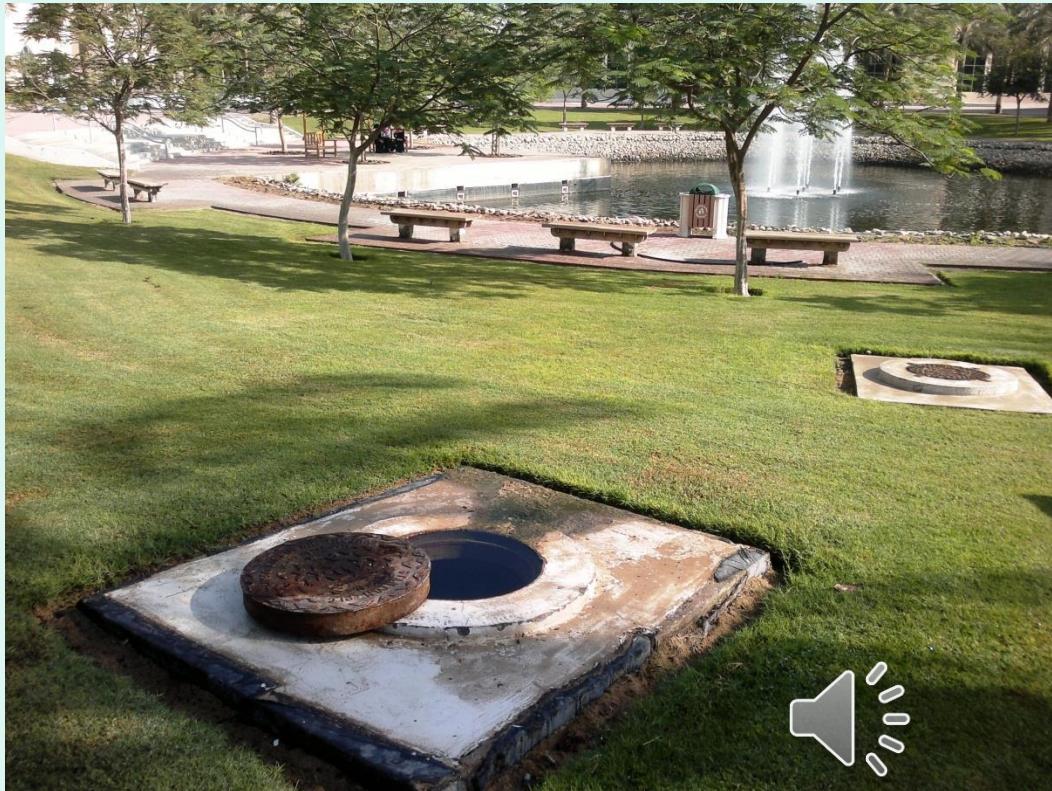


# Management (The first two columns are the most common among children)

M a n d i b l e	Dental Phase	No displacement	Greenstick	Displaced	Comminuted
M a x i ll a	1ry dentition	Conservative	Conservative +or- IMF.	Conservative +or- closed reduction +or- IMF.	Conservative +or- closed reduction +or- IMF +or- Open reduction.
	Mixed dentition	Conservative	Closed reduction +or- IMF	IMF +or- Open reduction	IMF +or- Open reduction
	Permanent dentition	Conservative +or- IMF	Open reduction +or- IMF	Open reduction +or- IMF	Open reduction +or- IMF
Important Question... What do you think would be the outcome if you do IMF to a child with condylar or sub condylar fracture??					
M a x i ll a	1ry dentition	Conservative +or- closed reduction +or- open reduction.	Conservative +or- closed reduction +or- open reduction.	Closed reduction +or- open reduction.	Closed reduction +or- open reduction.
	Mixed dentition	Conservative +or- closed reduction +or- open reduction.	Conservative +or- closed reduction +or- open reduction.	Open reduction	Open reduction
	Permanent dentition	Conservative +or- closed reduction +or- open reduction.	Conservative +or- closed reduction +or- open reduction.	Open reduction	Open reduction.

**Keep your face to the sunshine  
and you can not see a shadow.**

Helen Keller



**Please Keep  
your face  
safe😊**

Hisham El Batawi

I relied much that you have had the same topic  
in your Oral Surgery course.

Please if you have  
any questions, don't hesitate to contact me.

Thank You.