OSTEO-BIOLOGICS
THE BASICS

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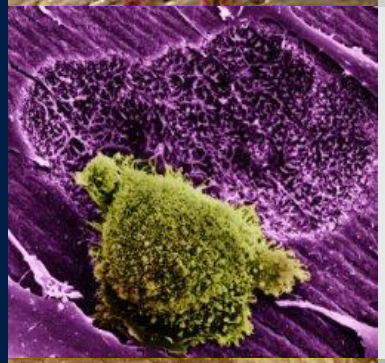
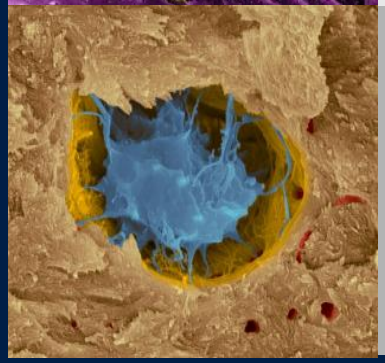
BONE CELLS

Osteoblast Bone-forming cell that lays down new bone matrix (Osteoid). Mesenchymal stem cells, when activated by certain BMPs, differentiate into osteoprogenitor cells, which then differentiate into osteoblasts

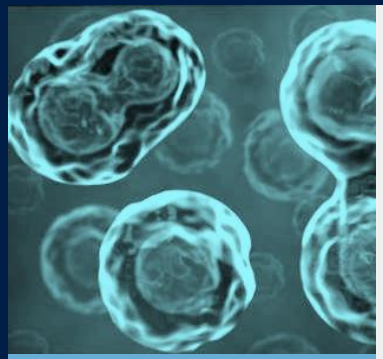


Osteoclast A large multinucleated cell that plays an active role in bone resorption by dissolving bone mineral and degrading organic bone matrix. The combined activity of osteoclasts and osteoblasts is responsible for the continuous bone remodeling process

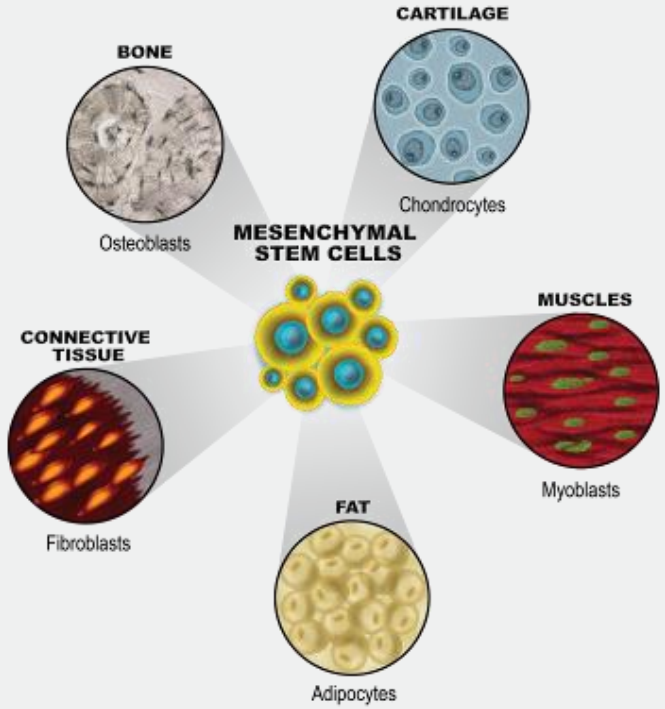


Osteocyte Once osteoblasts become trapped in the bone matrix, they become osteocytes. They are responsible for the maintenance of bone

BONE CELLS



Mesenchymal Stem Cell (MSC) Pluri-potent stem cells that can differentiate into a variety of cell types. In the presence of certain BMPs, MSCs will differentiate into bone forming cells. MSCs are typically found in periosteum, blood, surrounding muscle, fat and bone marrow



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MECHANISMS OF ACTION

OSTEOGENESIS
The "Seeds"

ANALOGY

THERAPY EXAMPLE

OSTEOCONDUCTION
The "Scaffold"

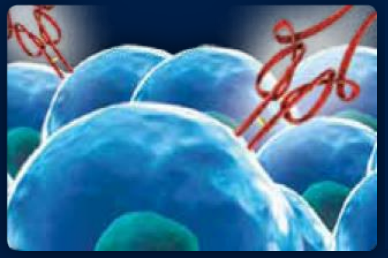
ANALOGY

THERAPY EXAMPLE

OSTEOINDUCTION
The "Fertilizer"

ANALOGY

THERAPY EXAMPLE



CATEGORIZATION OF BONE GRAFT SUBSTITUTES

ALLOGRAFTS

Cadaveric bone and tissue

- GRAFTON
- DBX
- ACCELL
- ALLOMATRIX
- OSTEOSET DBM

GROWTH FACTORS

rh-BMP , PDGF etc..

- INFUSE
- OP-1*
- AUGMENT

CERAMICS

Synthetically Produced

- MASTERGRAFT
- VITOSS
- OSTEOSET
- CHRONOS
- HEALOS
- ProOSTEON
- ACTIFUSE*

* = Pulled from Canadian Market.

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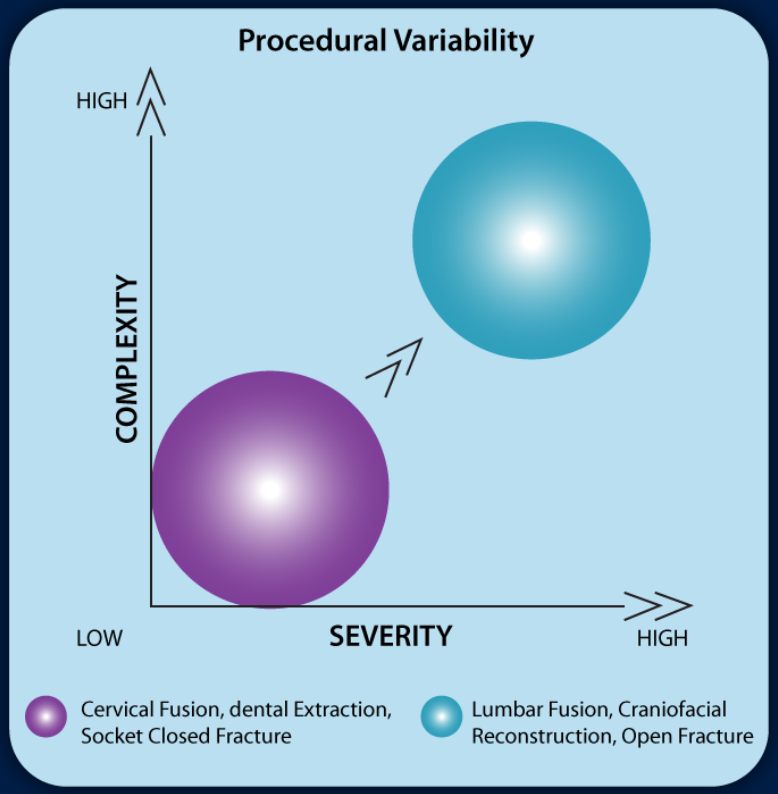
DECISION FACTORS



Bone grafting is one of several factors that are critical to skeletal healing…

1. Conditions at the bone graft site
2. Systemic patient health variables
3. Surgical technique
4. Bone graft capacity
   - Volume?
   - Ease of use and handling?
   - Osteoconductive capacity?
   - Osteoinductive capacity?

! Important

As the number of comorbidities and complexity/severity of the case increase, the healing environment gets more challenging.

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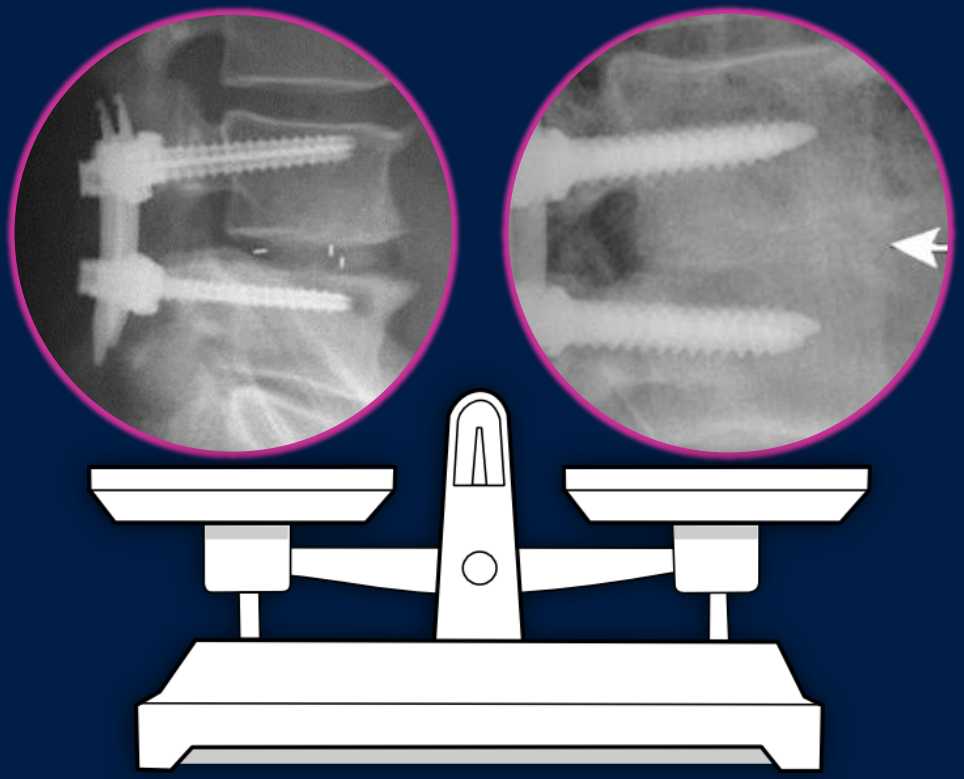
THE BALANCING ACT

Balancing Stabilization and Biological Activity

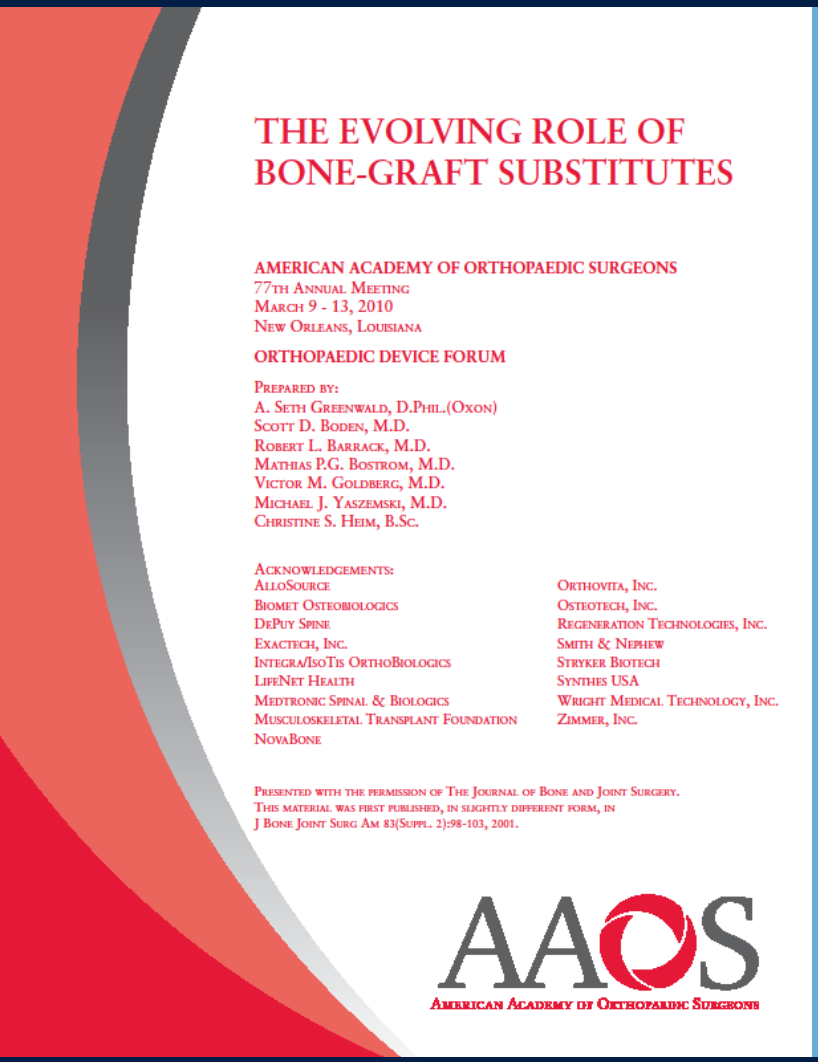
- Absence of new bone formation may lead to eventual instrumentation failure

Mechanical Stabilization
(Temporary)



New Bone Formation
(Permanent)

REALITY CHECK



THE EVOLVING ROLE OF BONE-GRAFT SUBSTITUTES

AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS
77TH ANNUAL MEETING
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ORTHOPAEDIC DEVICE FORUM

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200+ bone grafting products available from 50+ different companies today.

What to use when?

It's reasonable to assume not all bone grafting options perform the same.

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THANK YOU