

The Strength of Resorbable Fixation

Healing Dynamics

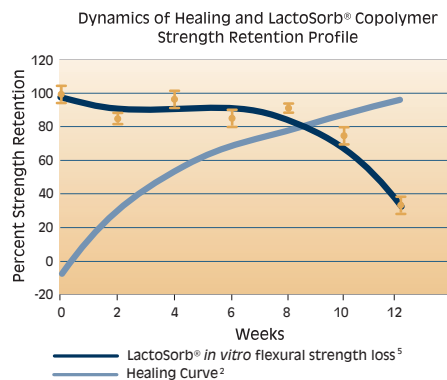
As a general rule, with appropriate fixation, about 6–8 weeks is required for good primary healing.^{1,2}

Resorbable Fixation Dynamics

The *percent strength* of resorbable fixation will decrease from its initial value (100%) to zero percent over a time period. The *absolute value* of the strength of the resorbable fixation, however, will also depend upon the *design* of the implant.³ A large implant will have greater strength than a similar smaller implant. The absolute strength of the resorbable implant must meet the physiological demands placed upon it during healing, which will vary with the application.

Variable Load Sharing

Initially, 100% of the strength of the repair site is provided by the resorbable implants. When the implants lose all strength, then 100% of the fixation should be provided by the biological union. At intermediate times, the load is shared between the resorbable implants and the partially healed union. Ideally, the loss of strength of the resorbable fixation should mirror the increase in strength of the biological union over a 6–8 week period so that substantial strength of repair exists through all phases of healing.^{1,4}



Postoperative Rehabilitation

After orthopedic operative procedures, it is customary to place the patient under a condition of limited or non-load bearing for a period of time, gradually increasing the intensity of rehabilitation to full load or weight bearing.^{2,3} Such a protocol may include the initial use of supplemental casting, splinting or bracing. Thus, in the early healing phase when most of the strength of repair is carried by the resorbable fixation, actual loads placed on the operative site may be minimal.³

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4. Pietrzak WS, et al., *Bone*, 19(1):1095–1195
5. Pietrzak WS, et al., *Applied Biomaterials*, 38(1): 17–24; 1997.

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