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| **Adhesive and Cohesive Mechanisms** | * Mechanical Interlocking   + Relates to an adhesive moving not pores or around projections in the adherend surface   + Good tissue penetration improves mechanical interlocking and is influenced by the rheological properties of the adhesive   + Can be influenced through topographical modification * Molecular Bonding   + Common primary adhesive and cohesive interactions include Schiff base formation and amide bonding   + Common secondary interactions include   + π-π stacking, hydrogen bonding, dipole-dipole interactions and Van der Waals instantaneous dipoles   + Cross-linking density is a large determinant of cohesive strength * Electrostatic Bonding   + Formation of dispersion forces as a result of interactions between permanent dipoles   + Not a major contributor of adhesive strength in tissue sealants * Chain Entanglement   + Refers to a polymers ability to tangle with other polymer chains   + Increased flexibility and length of polymer chains allows for greater interpenetration and entanglement |
| **Bio-functionality** | * Mechanical and Physical Properties   + After application the adhesive should support local and organ specific cellular interactions   + The desired mechanical and physical properties should mimic local tissue * Curing Time   + Desired curing time will depend of clinical application   + Research is being undertaken into controllable polymerisation but is not used in commercially available products * Degradation Kinetics   + Can affect post-operative stability of an agent   + Rapid kinetics can lead to post-operative complications such as dehiscence |
| **Biocompatibility** | * Toxicity   + Agents should pose negligible toxicity to the host   + Toxicity of the agent, as well as metabolic products, should be assessed at a cytological, histological and systemic level * Immunogenicity   + Biomaterials should not be immunogenic   + Humoral and cytotoxic responses as well as local tissue reaction should be assessed * Gluing Process and Post-operative changes   + A mild gluing process is favoured to avoid damage to surrounding tissues   + Hydrophilic agents can expand in vivo and affect local tissue |
| **Economic** | * Tissue adhesives should be cost-effective * ICER can be a useful tool in presenting these economic analyses |