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### **Light Transmission of Different Dental Composite Resins**

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**Objectives** This study aims to analyze light transmittance of three different dental composites in various thicknesses to investigate how power of light sources influences the penetration.

**Methods** A total of 216 samples were fabricated from IPS Empress Direct (IPS), Lava Ultimate (LU), and Neo Spectra ST (NST) materials in three thicknesses (1 mm, 2 mm, 3 mm; n = 12/group) and cured using Valo and high power (HP) D-Light Pro light-curing devices. The light transmittance of the materials was measured with a spectrometer. Statistical analysis was performed using one-way ANOVA and post-hoc tests.

**Results** Samples with a thickness of 1 mm demonstrated significantly higher light transmittance compared to those with thicknesses of 2 and 3 mm within each material group. Samples with 1 mm thickness cured with HP showed light transmittance similar to 2 mm thick samples cured with Valo in the IPS group. Similar light transmittance was observed for samples with thicknesses of 2 and 3 mm across all materials and light-curing devices. The highest light transmittance was observed in 1 mm IPS samples, while the lowest was in 3 mm NST samples, in both light-curing devices. Additionally, 1 mm IPS samples polymerized with Valo showed significantly higher light transmittance compared to 2 and 3 mm NST and LU samples polymerized with both light devices.

**Conclusions** Light transmission in resin-composites is significantly influenced by thickness and curing device. Thinner samples generally exhibit higher transmittance with notable variations among materials and curing methods. Optimal transmittance was observed in 1 mm IPS samples, emphasizing the importance of thickness control for desired aesthetic outcomes.