Dear Editor,

International consensus over environmental mercury and promising long term clinical reports have seen direct resin composites emerge as the material of choice in most nations. Additionally, recent global economic constraints and a greater focus on minimum intervention have seen a further shift away from indirect ceramic and alloy restorations.

Manufacturers encouraged by research are busily producing the latest and greatest resin restoratives with excellent aesthetics and good handling. Two main properties remain elusive. The ability to obtain a strong durable bond to the remaining tooth substrate not only provides a hermetic seal but also allows the physical properties of the restorative material to support the tooth. Low polymerization setting stresses are critical here and the new flowable bulk fill materials are emerging as a good solution. Secondly, long term strength and toughness requires greater filler loading or fibre reinforcement. The new nano hybrids with elastic moduli approaching that of dentine (c. 17 GPa) are useful here. Therefore, at this stage of its development I suggest we need three materials: a durable bonding agent (preferably non HEMA); a very low stress intermediate material (preferably thin) and a tough finishing material.

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