

At Issue: Fluidics and cataract surgery



At Issue posed the following question to a panel of experts: "How important is fluidics today for performing modern phacoemulsification, including microincision cataract surgery?"



Eliminating ultrasound

Noel Alpins, MD: The evolution of phacoemulsification into the modern era has brought the progressive minimization of ultrasound time to approach its lowest possible level – zero – potentially eliminating ultrasound altogether from the small- and microincision procedure. This process has been achieved only by the mastery of fluidics to control the stability of the anterior chamber associated with the higher flow and vacuum settings necessary.

Fluidics management can be understood as a balancing act among multiple variables. In essence, the greater the

protect it from heat generated by the ultrasonic needle. Bimanual separate irrigation and aspiration is thus enabled.

The multiple variables can be grouped either under infusion, which depends on both the bottle height and tubing diameter, or outflow, with its components of aspiration flow rate and vacuum, wound leakage, tip profile and lumen size, tubing diameter and compliance. The net effect of these various components is observed as anterior chamber depth and can be gauged by IOP. Varying any single parameter will change the overall dynamics.

Delegating all these functions to the default values in the technology without necessarily comprehending their interrelationships is not a recipe for a smooth transition to microincision surgery. The new technologies have elevated micromanagement of fluidics to a level that makes bimanual microincision surgery possible for all savvy cataract surgeons.

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