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Comparison of Exhaled Breath Condensate Collection Methods

Exhaled Breath Condensate (EBC) can be collected with apparatus custom-built by an investigator ("home-made") or by using commercially available equipment.

The RTube™ was designed to be extremely flexible-it is useful in any setting. It was also important in the design of the RTube to keep it inexpensive so that pilot studies employing EBC could be performed without a large up front capital investment in a large machine. Furthermore, the RTube is disposable, so that studies of patients with potentially infectious diseases could be performed while protecting against cross-contamination. With the RTube, samples from dozens of patients can be collected concurrently, as each patient uses an inexpensive disposable collector. Indeed, we have collected samples from 80 subjects in less than 40 minutes total. That is efficiency! And it would be simply impossible without the RTube.

The ECoScreen is the other commercially-available device employed in the published literature. This machine is substantially larger than a desk-top computer, and is an additional machine for the Pulmonary Function Laboratory. There is a substantial outlay of money that is required to purchase this equipment. Additionally, there is the expense and technician time of cleaning the equipment between use. The collecting surface is Teflon coated, but needs to be cleaned in some fashion between use. The mouthpiece apparatus and valves are not disposable, and require cold sterilization between use to avoid risk of infectious transfer of saliva that can accumulate readily in the equipment. There is no system for excluding saliva that tends to be released by some subjects (especially older individuals) who provide EBC samples. A maximum of 3 samples can be collected per hour per machine, and then only if one has purchased 2 more collector tubes (inexpensive) and mouthpiece apparatus (expensive). Again, these need to be cleaned/sterilized before reuse.

Home made devices of various natures have also been used in research studies. These can be as simple as polypropylene tubes immersed in ice buckets, or as complicated as temperature-controlled thermocouple chillers surrounding glass tubings. As long as the system excludes saliva sufficiently, any system that works well for your planned use and fits your budget is reasonable. There have been few head-head comparisons between equipment.

Over the years, Respiratory Research, Inc. has built many different types and styles of EBC collectors and tested the efficiency and utility of them. We are confident that the RTube, with its safety and flexibility, is the best EBC collector for any purpose you may have in mind.

We will happily answer any questions you may have about the RTube.

Simply send an email to info@respiratoryresearch.com. We will answer promptly. Or feel free to telephone or write us.