

Pump IV Sets and Syringes

When testing any kind of infusion pump, the condition of the IV set or syringe you install in that pump will largely determine the

Quality,

Validity, and

Accuracy

of the test results you obtain with the Infutest, or with any pump tester.

IV sets and disposable syringes are mass-produced, single-use items made out of plastic. When an infusion pump operates, the pump mechanism "works" the IV set, and consequently the IV set wears out over time.

Pump manufacturers rarely specify a lifetime of more than 48 hours continuous for their pump IV sets. Despite this, there are things you can do to "stretch" IV sets so they remain usable for testing pumps in the lab over several days or even weeks.

When starting out, you should always obtain a ***new IV set*** for each make of pump you plan to be testing. Use the IV set *only* with distilled water or clean tap water. After testing the pump, ***drain*** the IV set and store it in an air-tight bag or container until another pump of the same type needs testing.

Never store an IV set in a pump or use the set's roller clamp or pinch clamps to keep the set primed. Doing so will quickly degrade the IV set and will likely influence the set's accuracy.

Your toolkit of "test IV sets" may remain usable up to several weeks if you treat them carefully as described above. However, ***accuracy*** of IV sets is usually not guaranteed by the manufacturer over such long intervals. Ideally, IV sets should be replaced in accordance with manufacturer's recommendations so test results will reflect the actual clinical usage of the infusion device. ***If*** you treat your IV sets with care, that means an IV set will remain usable for about 48

hours of (interrupted) pump testing.

It is unlikely you will be able to get the same "mileage" out of a disposable syringe that you can get with some infusion pump IV sets. ***In particular, when testing syringe pumps, always install a new disposable syringe in the pump before beginning your tests.*** This is most important if you are conducting accuracy tests in the microrate delivery range (0.1 ml/h to 10 ml/h).

A problem with disposable syringes is that the lubrication which the syringe manufacturer applies to the plunger tends to wear off after repeated use, causing the plunger to stick at unpredictable locations as it is moved along the barrel. This is especially true if you leave a disposable syringe filled with water, even for just a couple of days. A syringe pump equipped with an old, worn-out syringe ***will*** deliver erratically and inaccurately, and this will be evident as "spikes" appearing on Infutest's flow graph display. It is difficult to detect troublesome syringe "stiction" by hand, but the Infutest is certainly sensitive enough to reveal this problem in the fluid delivery.

If somebody gives you a pump to test, and that pump has a used set or syringe in it, take the set out of the pump and ***throw it away***. A set which has been used on a patient may contain saline, dextrose or other solutions which could potentially damage the Infutest.

If you ***must*** re-use an IV set for an incident investigation, first rinse the IV set with distilled water and then flush the Infutest thoroughly after the tests have been completed.