Infusion pump

Commercial intrathecal baclofen therapy infusion pumps are recommended to be refilled within a maximum of 180 days, thus necessitating at least twice-yearly outpatient visits and refill injections. In particular, pumps with 40-mL reservoir volumes would allow much longer refill intervals. We investigated baclofen stability in active implanted ITBT infusion pumps in vivo with refill intervals of up to 367 days to study the feasibility of lengthening refill intervals beyond six months.

They obtained 25 baclofen samples from 19 patients receiving ITBT with varying pump refill intervals. All patients had a baclofen infusion system delivering undiluted 2 mg/mL baclofen at continuous rates of 96.1 to 673.7 μ g/d with a concentration of 2.002 mg/mL. Baclofen concentrations of the infusate samples acquired during the refill procedures were analyzed using validated high-performance liquid chromatography with diode-array detection (HPLC-DAD) assay, later complemented with repeat assay with pH and physical measurements. We also present the validation data of the HPLC-DAD assay.

Results: During the mean refill interval of 247 days (SD 90, range 54-367 days), the mean change in baclofen concentration was -0.0156 mg/mL (-0.8%, SD 0.14, range -0.30 to 0.32 mg/mL, paired t-test p = 0.57, t24 = 0.57). Only a low negative correlation was found between the baclofen concentration and the refill interval (Pearson's r = -0.32, p = 0.12).

Korhonen et al. could not show a significant change in baclofen concentration over the time studied; 2 mg/mL baclofen ITBT refill intervals could be lengthened to up to one-year theoretical maximum refill interval in our cohort would have been 489 days. Further studies with larger sample sizes and other baclofen brands are warranted ¹⁾.

An external infusion pump is a medical device used to deliver fluids into a patient's body in a controlled manner. There are many different types of infusion pumps, which are used for a variety of purposes and in a variety of environments. Infusion pumps may be capable of delivering fluids in large or small amounts, and may be used to deliver nutrients or medications – such as insulin or other hormones, antibiotics, chemotherapy drugs, and pain relievers.

Some infusion pumps are designed mainly for stationary use at a patient's bedside. Others, called ambulatory infusion pumps, are designed to be portable or wearable.

A number of commonly used infusion pumps are designed for specialized purposes. These include:

Enteral pump - A pump used to deliver liquid nutrients and medications to a patient's digestive tract. Patient-controlled analgesia (PCA) pump - A pump used to deliver pain medication, which is equipped with a feature that allows patients to self-administer a controlled amount of medication, as needed. Insulin pump - A pump typically used to deliver insulin to patients with diabetes. Insulin pumps are frequently used in the home. Infusion pumps may be powered electrically or mechanically. Different pumps operate in different ways. For example: In a syringe pump, fluid is held in the reservoir of a syringe, and a moveable piston controls fluid delivery. In an elastomeric pump, fluid is held in a stretchable balloon reservoir, and pressure from the elastic walls of the balloon drives fluid delivery. In a peristaltic pump, a set of rollers pinches down on a length of flexible tubing, pushing fluid forward. In a multi-channel pump, fluids can be delivered from multiple reservoirs at multiple rates. A "smart pump" is equipped with safety features, such as user-alerts that activate when there is a risk of an adverse drug interaction, or when the user sets the pump's parameters outside of specified safety limits.

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Korhonen TK, Koopmans P, Touw DJ, Tetri S. Baclofen Stability up to One Year in In Vivo Intrathecal Infusion Pumps. Neuromodulation. 2023 Dec 3:S1094-7159(23)00756-0. doi: 10.1016/j.neurom.2023.09.006. Epub ahead of print. PMID: 38043050.

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