

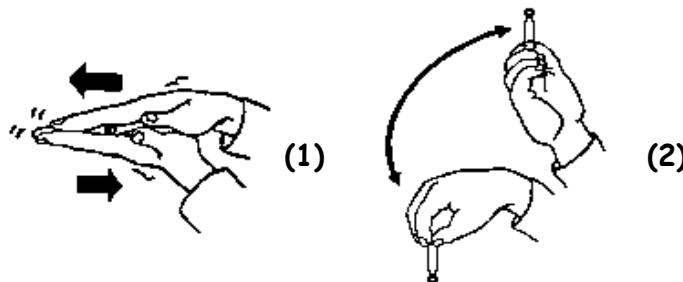
## MIXING AND USING INSULIN PEN CARTRIDGES

### FOR MIXING NPH ("N") CARTRIDGES/PENFILLS, OR INSULIN ALREADY IN PENS:

Cartridges of Humulin® N and Penfills® of Novolin® NPH—including Regular/NPH, Humalog/NPH, and NovoRapid/NPH premixes—contain a small glass bead to assist in mixing. Vials don't have this bead, but they should be mixed well just the same.

Proper mixing of NPH ("N") includes rolling (1) the cartridge between the palms ten (10) times, FOLLOWED BY inverting (2) the cartridge 180° ten (10) times, so that its contents are uniform. This applies to cartridges used with or without pens.

**Mixing should be done EVERY time you use your cartridge!** NPH ("N") must be mixed correctly to ensure correct dosage, otherwise you could receive anywhere from one-half to twice the desired dose of insulin, which will greatly affect your blood glucose readings.



NPH ("N") should look uniformly cloudy or milky after mixing (3). DO NOT USE insulin if after mixing it there are clumps floating in the insulin, or solid white particles stuck to the bottom or sides of the cartridge, giving it a frosted look (4). A cartridge that appears frosted or that contains clumps should be returned to the pharmacy.



See also our handout [Using Insulin Pens for Injections](#).

## **INSULIN STORAGE:**

Unused insulin should be stored in the fridge. Do not use after the expiry date. Open insulin may be stored at room temperature, but it needs to be replaced every month. Some people find they need to replace the insulin sooner (every 3 weeks) if the blood sugars are fluctuating unexpectedly. Keep insulin away from heat and direct sunlight. **DO NOT FREEZE!**

## **USING INSULIN PEN CARTRIDGES/PENFILLS WITH SYRINGES:**

- 1) Read labels to make sure you have the correct insulin and check expiry dates.
- 2) Mix the cartridge of long-acting insulin by rolling it ten (10) times and inverting it 180° ten (10) times, as shown in Figures (1) and (2) above. The cartridge contains a tiny glass bead that assists in even mixing.
- 3) Turn the cartridge upside down (see diagram below).
- 4) **DO NOT INJECT AIR INTO THE CARTRIDGES, AS IS DONE WITH INSULIN VIALS.**
- 5) Insert needle into the short-acting cartridge and withdraw the short-acting dose.
- 6) Remove all air bubbles from the syringe before taking the needle out of the cartridge of short-acting insulin. You may have to rapidly inject the short-acting insulin back into the cartridge once or twice to accomplish this.
- 7) Remove the needle from the cartridge of short-acting insulin and put the needle into the mixed cartridge of long-acting insulin, making sure none of the insulin goes into the long-acting cartridge. You may want to hold onto the plunger part of the syringe.
- 8) Turn the cartridge of long-acting insulin upside down and withdraw the long-acting dose. Make sure none of the insulin goes back into the cartridge.
- 9) Check that the total units of insulin drawn up is correct.

