

# Insulin Storage and Stability

## Manufacturer Vials and Pens

In response to inquiries from patients and healthcare providers, we have gathered storage and stability information from insulin manufacturers and the most current medical literature available. Varying non-referenced or clinically supported sources exist which can lead to confusion and possibly patient harm. The following charts serve as a referenced guide to the stabilities of insulin vials and pens after initial use and predrawn insulin syringes. Remember, as future information becomes available, you will need to validate the reference and update your clinical references accordingly. Information current as of May 30, 2002.

| Vial                       | Unopened refrigerated | Unopened room temp | Seal punctured, refrig/room temp* |
|----------------------------|-----------------------|--------------------|-----------------------------------|
| Humulin R <sup>5</sup>     | labeled exp date      | 28 days            | 28 days                           |
| Humulin N <sup>5</sup>     | labeled exp date      | 28 days            | 28 days                           |
| Humulin L <sup>5</sup>     | labeled exp date      | 28 days            | 28 days                           |
| Humulin U <sup>5</sup>     | labeled exp date      | 28 days            | 28 days                           |
| Humulin 70/30 <sup>5</sup> | labeled exp date      | 28 days            | 28 days                           |
| Humalog <sup>5</sup>       | labeled exp date      | 28 days            | 28 days                           |
| Humalog 75/25 <sup>5</sup> | labeled exp date      | 28 days            | 28 days                           |
| Novolin R <sup>5</sup>     | labeled exp date      | 30 days            | 30 days                           |
| Novolin N <sup>5</sup>     | labeled exp date      | 30 days            | 30 days                           |
| Novolin L <sup>5</sup>     | labeled exp date      | 30 days            | 30 days                           |
| Novolin 70/30 <sup>5</sup> | labeled exp date      | 30 days            | 30 days                           |
| Novolog <sup>5</sup>       | labeled exp date      | 28 days            | 28 days                           |
| Lantus <sup>5**</sup>      | labeled exp date      | 28 days            | 28 days                           |

\*Potency loss may occur after the bottle has been in use for >1 month, especially if stored at room temperature.<sup>1</sup>

\*\*Lantus should not be mixed with other insulin products. No data is available on stability of predrawn Lantus syringes.<sup>5</sup>

| Pen                          | Unopened refrigerated | Unopened room temp | In use* room temp |
|------------------------------|-----------------------|--------------------|-------------------|
| Humulin N <sup>5</sup>       | labeled exp date      | 14 days            | 14 days           |
| Humulin 70/30 <sup>5</sup>   | labeled exp date      | 10 days            | 10 days           |
| Humalog <sup>5</sup>         | labeled exp date      | 28 days            | 28 days           |
| Humalog 75/25 <sup>5</sup>   | labeled exp date      | 10 days            | 10 days           |
| Novolin R <sup>5</sup>       | labeled exp date      | 28 days            | 28 days           |
| Novolin N <sup>5</sup>       |                       |                    |                   |
| 3ml cartridge                | labeled exp date      | 14 days            | 14 days           |
| 1.5ml cartridge              | labeled exp date      | 7 days             | 7 days            |
| Novolin 70/30 <sup>5</sup>   |                       |                    |                   |
| 3ml cartridge                | labeled exp date      | 10 days            | 10 days           |
| 1.5ml cartridge              | labeled exp date      | 7 days             | 7 days            |
| Novolog Penfill <sup>5</sup> | labeled exp date      | 28 days            | 28 days           |

\*Manufacturer recommends not to refrigerate pens in use

## Insulin Syringes Predrawn from Manufacturer Vials

Novolin and Humulin products as a single entity predrawn syringe can be stored for 30 and 21 days, respectively, under refrigeration.<sup>5</sup>

No data is available on the stability of Humalog and Novolog products as a single entity predrawn syringe.<sup>5</sup>

| Insulin Product          | Combined with... | Stability with refrigeration | Comments  |
|--------------------------|------------------|------------------------------|---|
| Novolin R <sup>2,5</sup> | Novolin N        | 30 days                      | —   |
| Novolin R <sup>1,5</sup> | Novolin L        | 30 days                      | Standardize the interval between mixing and injection (~24 hours) |
| NovoLog <sup>5</sup>     | Novolin N        | Use immediately              | NovoLog should be drawn up first                                  |

*\*NPH or Velosulin BR should not be mixed with Lente or Ultralente insulin*  
*\*\*Store predrawn syringes in vertical position with needle pointing up to prevent clogging of the needle*

| Insulin Product          | Combined with...    | Stability with refrigeration | Comments  |
|--------------------------|---------------------|------------------------------|---|
| Humulin R <sup>4,5</sup> | Humulin N           | 21 days                      | —   |
| Humulin R <sup>4,5</sup> | Humulin L or U      | 21 days                      | Standardize the interval between mixing and injection (~24 hours) |
| Humalog <sup>5</sup>     | Humulin N or L or U | Use immediately              | Humalog should be drawn up first                                  |

*\*Humulin N should not be mixed in the same syringe with Humulin L or U*  
*\*\*Store predrawn syringes in vertical position with needle pointing up to prevent clogging of the needle*

## References:

- American Diabetes Association. Insulin Administration. *Diabetes Care*. 2002;25(Suppl 1):S112-115.
- Peters AL, Davidson MB. Effect of storage on action of NPH and regular insulin mixtures. *Diabetes Care*. 1987;10(6):799-800.
- Drass J. What you need to know about insulin injections. *Nursing* 92. 1992;22(11):40-43.
- Tarr BD, Campbell RK, Workman TM. Stability and sterility of biosynthetic human insulin stored in plastic insulin syringes for 28 days. *Amer J Hosp Pharm*. 1991;48:2631-2634.
- Information on specific insulin products were gathered from most recent package inserts and communication with manufacturing companies including Aventis, Eli Lilly and Company, and Novo Nordisk.

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