

Adjustment of NPH insulin (Novolin N or Humulin N) under prednisone therapy

Introduction

Prednisone is a powerful therapy used for the treatment of inflammation (arthritis, skin, muscle, liver & lung conditions including asthma, thyroid eye disease) and some cancers and as an organ anti-rejection therapy in transplant patients.

Prednisone tends to elevate blood sugar levels. Some non-diabetic patients given prednisone develop diabetes: the best treatment is often insulin. The best insulin is usually NPH (Novolin N or Humulin N). Patients with existing diabetes given prednisone often need to have insulin added or to change insulin schedules.

Principles of NPH insulin therapy

The primary target for insulin treatment in this case is to produce a blood sugar before the evening meal in the **5.0 - 10.0** range.

The reason to test the blood sugar before breakfast is to ensure that the sugar does not go low: i.e. not < 5.0. If the sugar before breakfast is >8.0 your doctor may decide to give a second shot of NPH insulin in the evening or use a completely different kind of insulin such as glargine.

The usual starting dose of NPH is 10 - 16 units per day (0.1-0.2 units/ kg)

Take the NPH insulin shot and prednisone at the same time, usually before breakfast unless the doctor prescribing the prednisone has indicated it should be taken at a different time. If you are taking your prednisone at a time other than before breakfast this handout does not apply.

Be prepared to adjust the NPH insulin dose every morning based on the blood sugar before the evening meal yesterday.

NPH insulin adjustment rules

1) IF the blood sugar before breakfast is >5

a) If sugar before the evening meal is between 5 & 10 **keep the dose the same as yesterday.**

Example: The dose of NPH insulin yesterday was 10 units. Blood sugar before breakfast this morning is 5.9 and blood sugar before evening meal yesterday was 7.4. These are within your target range. Today the dose is 10 units again.

b) If sugar before evening meal >10 **take 2 units more than yesterday.**

Example: The dose of NPH insulin yesterday was 10 units. This morning blood sugar is 7.2 and before evening meal yesterday it was 11.2, above the target of 5.0-10.0. Today the dose should be 12 units ($10 + 2 = 12$). 12 units is the new dose.

c) If sugar before the evening meal <5 **reduce your next NPH dose by 40%.**

Example: The dose of NPH insulin yesterday was 10 units. Blood sugar before breakfast this morning is 6.3 but sugar before the evening meal yesterday was 4.8, below the target of 5.0-10.0. Today the dose should be reduced by 40% - so the dose 6 units ($0.6 \times 10 = 6$). 6 units is the new dose.

2) IF the blood Sugar before breakfast is >5 but the dose of prednisone is lower

reduce your next NPH dose by 20%.

Example: The dose of NPH insulin yesterday was 10 units. This morning blood sugar is 8.3 and before the evening meal yesterday was 9.5; but today the dose of prednisone is less than yesterday. Today the dose of insulin should be 20% less: so the dose is 8 units ($0.8 \times 10 = 8$). 8 units is the new dose.

3) IF the blood Sugar before breakfast is <5 (regardless of the prednisone dose)

reduce NPH insulin by 40% & notify your Diabetes case manager, nurse or doctor right away.

Example: The dose of NPH insulin yesterday was 10 units.. This morning blood sugar is below the target at 4.5.. This morning the dose is 40% less ie 6 units ($0.6 \times 10 = 6$) and call your Diabetes case manager for further advice..

Example of NPH adjustment during prednisone therapy assuming starting dose of 10 U

Example Day #	Sugar before breakfast	Sugar before evening meal	Prednisone Dose change?	NPH Dose Change	Today's NPH Dose
1	6.8	8.5		nil	10
2	5.4	9.6	Yes, Reduction	reduce by 20%	8
3	7.3	11.1		+2	10
4	8.5	4.8		reduce by 40%	6
5	6.8	11.7		+2	8
6	7.8	7.5		nil	8
7	5.6	13		+2	10
8	8.4	4.4		reduce by 40%	6
9	4.6	6.6		reduce by 40% + call case manager	3 (round down)