Annotated Examples of Subcutaneous Insulin Order Forms

Example 1 — University of California, San Diego (UCSD)
At UCSD, computerized physician order entry and a very positive experience with the algorithm in the previous section led to an opportunity to attempt a very high degree of integration of the algorithm and policies into the "next generation" order set. The screen shots from the order set show how the algorithm with its suggested pathways can drive turning your order set into a more protocol-like approach. The UCSD order set can be seen as one extreme end of a more protocol-like approach to integrating guidance into the order set, whereas the basic order set (see Track Performance>Practical Recommendations) represents the opposite end of the spectrum. (Special thanks to Josh Lee MD, UCSD hospitalist and informatics liaison extraordinaire, for assisting with creation of the CPOE order set.) Other examples show some varying degree of "protocolization." You'll have to decide what is most desirable and feasible at your own institution.

The first time subcutaneous insulin is ordered, there is a prompt to discontinue all oral hypoglycemic agents, a prompt to order an HbA1C if the patient hasn't had one recently, and an actionable glycemic target. Action-able *means that if the glucose readings are outside the desired range and no changes in insulin orders have occurred in 24 hours, the physician is called and a request to adjust insulin orders is made.*

```
PCIS                    UCSD Healthcare Information Network
 PINA ,PAUL                MR#: 16025330  MICU        MICU04   02/23/06  1737
    70001532   M    05/02/1963   Age:   42   SGS      ORDERS DISPLAY
                      Insulin Subcutaneous Orders ---------- ALLERGY     -
  Please discontinue all current hypoglycemics, such as sulfonylureas,—
  glitazones and metformin containing formulations (no order)

  Please select one of the Glycemic control targets:
[X] Glycemic Target is 80-130 mg/dL preprandial, no sugars > 180 mg/dL.
    (Best goal in patients who have achieved 80-150 mg/dL without difficulty)
[ ] Glycemic Target is 90-150 mg/dL preprandial, no sugars > 180 mg/dL.
    (Good choice to start with in most patients)
[ ] Glycemic Target is 100-200 mg/dL.
    (Less stringent goal more suitable for some patients with end stage disease
     or other issues that makes stringent control a less important factor)

                                              LCH0445 rnt draw next av onc
[X] If no Hemoglobin A1C (glycosylated hemoglobin) drawn in the past month,
    please order now.
  Glycemic target for this patient is <100-200..>;contact first call provider
  if patient is outside of range 2 or more times in one shift.  phm ongoing

Skip | Insulin Help | New Orders | Hypoglycemia Protocol | OK
PVISSMNA          TRAINING MODE  Ovr          Field Help  Suspend
```

On the next screen, all prior insulin orders are discontinued, and the ordering physician is asked to put in the information needed to calculate a reasonable starting estimate for the total daily dose of insulin required and to classify the patient's nutritional intake. Clicking on the OK button leads to the next screen, where the total daily dose estimate under this method is auto-calculated (per UCSD algorithm an overweight patient who weighs 100 kg would have a suggested TDD of 50 units [100 kg x 0.5 units/kg/day = 50 units]). If desired, the physician can change this TDD and is also offered alternate ways to calculate it (including guidance on insulin dosing for the transition from insulin infusion to subcutaneous insulin).

```
PCIS                    UCSD Healthcare Information Network
 PINA ,PAUL                MR#: 16025330  MICU        MICU04   02/23/06  1739
    70001532   M    05/02/1963   Age:   42   SGS      ORDERSETS
                      Insulin Subcutaneous Orders ---------- ALLERGY     -
                                                         Page 2
   D/C All prior Insulin-related orders except Insulin drips
   Dosing Weight: [100] Kg
== Insulin Sensitivity / Body Habitus: Please Select one =============
[ ] Patient is standard, normal body habitus
[ ] Patient is very lean, or has hypoglycemia risk factors (ESRD, on
     hemodialysis, or very sensitive to insulin
[X] Patient is overweight
[ ] Patient is obese, on steroids, or known to be insulin resistant

== Nutritional Intake: Please Select one ============
[ ] Patient is eating/receiving bolus tube feedings
[ ] Patient is receiving continuous infusions of tube feeds or parenteral
    nutrition as a primary calorie source
[X] Patient is NPO or on clear liquids

Skip | Insulin Help | New Orders | Hypoglycemia Protocol | OK
PVISSMNX          TRAINING MODE  Ovr          Field Help  Suspend
```

PCIS UCSD Healthcare Information Network

PINA ,PAUL MR#: 16025330 MICU MICU04 02/23/06 1741
70001532 M 05/02/1963 Age: 42 SGS ORDERSETS

Insulin Subcutaneous Orders ALLERGY -

Please Select One Page 2

[X] Suggested Total Daily Dose (TDD) of insulin 50

This TDD suggestion is derived by patient's weight and body habitus / insulin sensitivity.

Other methods to calculate the TDD:

- Transition from insulin infusion- Average hourly rate over last 6 hours, multiply by 20:
  - If TF, TPN, or meals, this is TDD.
  - If insignificant nutrition in last 6 hours, double the number to get TDD.
- Total all insulins used at home (adjust up if poorly controlled)

Note: TDD estimate assumes good caloric intake, but you can adjust for poor or uncertain caloric intake later.

Skip | New Orders | Hypoglycemia Protocol | OK

PVISSMNJ | TRAINING MODE | Ovr | Field Help | Suspend

The UCSD algorithm calls for glargine insulin as the basal insulin (40% of calculated TDD), regular insulin as the correction dose insulin (to be administered every 6 hours). For this overweight 100-kg NPO patient with a TDD of 50 units, the glargine dose is calculated as being approximately 20 units. Note the prompts for a dextrose-containing IV fluid for NPO patients, as well as the instructions to continue the full dose of basal glargine insulin when the patient is NPO. Correction-dose regular insulin looks like a traditional sliding scale, but the aggressiveness of the correction dose actually varies with the TDD estimate (the ordering physician sees only the scale most suited to the patient's insulin sensitivity).

PCIS UCSD Healthcare Information Network

PINA ,PAUL MR#: 16025330 MICU MICU04 02/23/06 1743
70001532 M 05/02/1963 Age: 42 SGS ORDERSETS

Insulin Subcutaneous Orders ALLERGY -
Page of

Check Fingerstick q6h

[X] D5 + 1/2 NS @ 75 mL/hr
(generally recommended for Pt on NPO for Surgery)

Select One Basal Insulin

[ ] Glargine (Lantus) 20 units qAM ____ OR ____
[ ] Glargine (Lantus) 20 units qAC Lunch ____ OR ____
[X] Glargine (Lantus) 20 units qHS ____ OR ____

[ ] NPH 10 units in AM once (Pt has Surgery or Procedures)

Give full basal Lantus dose even if nutrition interrupted or patient is NPO [ ] More Info on basal Lantus/NPH

TDD *.5 *2/3 *1/2

Skip | New Orders | Hypoglycemia Protocol | OK

PVISSMNP | TRAINING MODE | Ovr | Field Help | Suspend

PCIS — UCSD Healthcare Information Network

PINA ,PAUL MR#: 16025330 MICU MICU04 02/23/06 1745
70001532 M 05/02/1963 Age: 42 SGS ORDERSETS

Insulin Subcutaneous Orders — ALLERGY -

Correction Dose Scales for regular Insulin TDD 40-60 — Page 5

Glucose Range	q6h
70-150 mg/dL	0 Correction Dose
151-175 mg/dL	+ 2 units
176-200 mg/dL	+ 4 units
201-225 mg/dL	+ 6 units
226-250 mg/dL	+ 8 units
251-300 mg/dL	+ 10 Units
>300 mg/dL	+ 12 Units
<70 mg/dL	See Hypoglycemia Protocol

Skip | New Orders | OK

PVISSRG2 | TRAINING MODE | Ovr | Field Help | Suspend

The next patient is an 80-g obese person who is eating regular meals. A TDD of 48 units of insulin is auto-calculated and accepted by the physician. Forty percent of the TDD (20 units) is distributed as basal glargine insulin as the preferred default, whereas 10 units of a rapid-acting analogue insulin (lispro at UCSD) is administered on a scheduled basis with each meal (see next page). Minimum glucose monitoring for the eating patient (q AC and HS) is automatically ordered.

PCIS — UCSD Healthcare Information Network

ALASKA ,KELLY MR#: 19082841 CCU CCU10 02/23/06 1755
70737374 F 01/15/1971 Age: 35 MGM ORDERSETS

Insulin Subcutaneous Orders — ALLERGY -

Page 2

D/C All prior Insulin-related orders except Insulin drips

Dosing Weight: 80 Kg

== Insulin Sensitivity / Body Habitus: Please Select one =============

- [ ] Patient is standard, normal body habitus
- [ ] Patient is very lean, or has hypoglycemia risk factors (ESRD, on hemodialysis, or very sensitive to insulin
- [ ] Patient is overweight
- [x] Patient is obese, on steroids, or known to be insulin resistant

== Nutritional Intake: Please Select one ============

- [x] Patient is eating/receiving bolus tube feedings
- [ ] Patient is receiving continuous infusions of tube feeds or parenteral nutrition as a primary calorie source
- [ ] Patient is NPO or on clear liquids

Skip | Insulin Help | New Orders | Hypoglycemia Protocol | OK

PVISSMNX | TRAINING MODE | Ovr | Field Help | Suspend

These materials can be found in Appendix H of the Glycemic Control Implementation Guide

PCIS UCSD Healthcare Information Network

ALASKA ,KELLY MR#: 19082841 CCU CCU10 02/23/06 1756
70737374 F 01/15/1971 Age: 35 MGM ORDERSETS
Insulin Subcutaneous Orders ALLERGY -
Page 3

Total Daily Dose: 48
Check Fingerstick qAC and qHS

==================== Select One Basal Insulin ====================

☐ Glargine (Lantus) 20 units qAM ____ OR ____
☐ Glargine (Lantus) 20 units AC Lunch ____ OR ____
☒ Glargine (Lantus) 20 units qHS ____ OR ____

☐ NPH 16 units qAM and 8 units qHS

Give full basal Lantus/NPH dose even if nutrition
interrupted or patient is NPO More Info

Skip | New Orders | Hypoglycemia Protocol | OK

PVISSMNK | TRAINING MODE | Ovr | Field Help | Suspend

Note the reminder to reduce the nutritional insulin amount if the patient is eating < 100% of the expected nutritional intake. The medication administration record (MAR) contains instructions to hold this nutritional insulin should the nutrition be withheld or declined by the patient. Note also that the timing of the insulin administration in relation to the meal is repeated here and on the MAR. The correction-dose scale is different for the eating patient than it is for the NPO patient, in that the q HS correction scale is less aggressive. Note again that the aggressiveness of the scale varies to match the patient's sensitivity to insulin, as reflected by the TDD.

PCIS UCSD Healthcare Information Network

ALASKA ,KELLY MR#: 19082841 CCU CCU10 02/23/06 1846
70737374 F 01/15/1971 Age: 35 MGM ORDERSETS
Insulin Subcutaneous Orders ALLERGY -
Page 4

Nutritional Insulin	Breakfast	Lunch	Dinner
☒ Lispro (Humalog) w/first bite of each meal	10	10	10

Doses above assume the patient is
eating 100% of meal, if this is not the
case, click More Info on how to adjust
for partial intake of meals: More Info

============= Correction or Adjustment Insulin =============
☒ Dose Adjustment Insulin (w/first bite of each meal) Lispro Sliding Sca
☐ No Adjustment Insulin (No Sliding Scale)

Skip | New Orders | OK

PVISSMNL | TRAINING MODE | Ovr | Field Help | Suspend

These materials can be found in Appendix H of the Glycemic Control Implementation Guide

PCIS UCSD Healthcare Information Network

ALASKA ,KELLY MR#: 19082841 CCU CCU10 02/23/06 1758
70737374 F 01/15/1971 Age: 35 MGM ORDERSETS

Insulin Subcutaneous Orders ALLERGY -

Correction Dose Scale for Humalog(Lispro) TDD 40-60 Page 5

Glucose Range	qAC	qHS
70-150 mg/dL	0 Correction Dose	0 Correction Dose
151-175 mg/dL	+ 2 units	0 Correction Dose
176-200 mg/dL	+ 4 units	0 Correction Dose
201-225 mg/dL	+ 6 units	+ 3 units
226-250 mg/dL	+ 8 units	+ 4 units
251-300 mg/dL	+ 10 Units	+ 5 Units
>300 mg/dL	+ 12 Units	+ 6 Units
<70 mg/dL	See Hypoglycemia Protocol	

Skip | New Orders | OK

PVISSLS5 TRAINING MODE Ovr Field Help Suspend

PCIS UCSD Healthcare Information Network

ALASKA ,KELLY MR#: 19082841 CCU CCU10 02/23/06 1759
70737374 F 01/15/1971 Age: 35 MGM ORDERS DISPLAY

Insulin Subcutaneous Medications ALLERGY

Description	Start D/T	Sched Stop
******* THERE ARE NO orders approaching expiration *************		
INSULIN LISPRO (HUMALOG) 10. UNITS SQ ACDIN	02/24 17:30	03/25
INSULIN LISPRO (HUMALOG) 10. UNITS SQ ACLUN	02/24 11:30	03/25
INSULIN LISPRO (HUMALOG) 10. UNITS SQ ACBRK	02/24 07:30	03/25
CORRECTION LISPRO AC SQ DAILY	02/24 07:00	03/25
INSULIN GLARGINE (HUMAN) 20. UNITS SQ HS	02/23 21:00	03/24
FINGERSTICK MONITORING AC+HS	02/23 21:00	03/25
CORRECTION LISPRO HS SQ DAILY	02/23 21:00	03/24

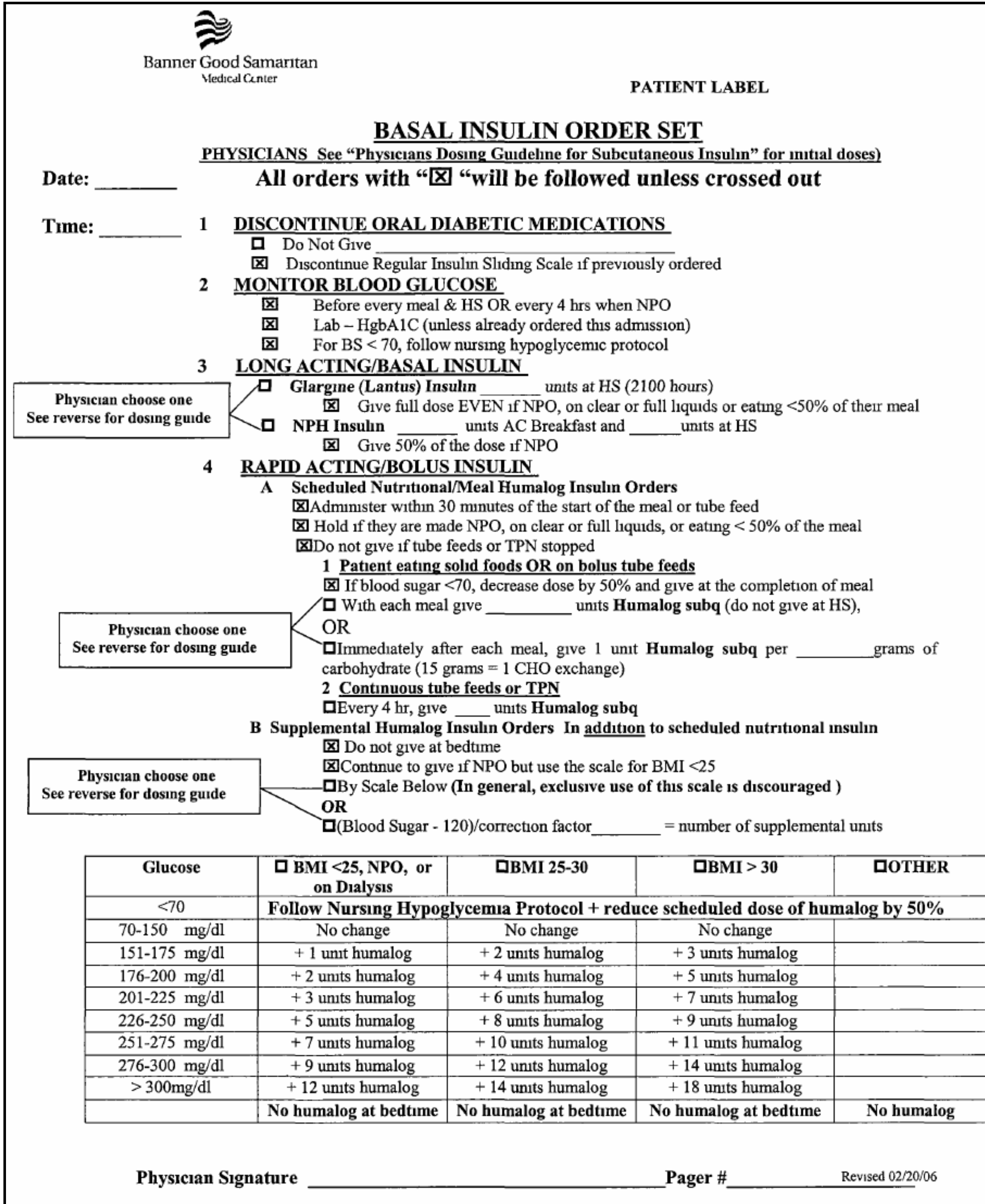
Orders | Skip | Detail | Adjust All Insulins | Revise Individual Insulins | Renew | D/C Individual Insulin

PVORMED2 TRAINING MODE Ovr Field Help Suspend

The next time you enter the subcutaneous insulin orders, the regimen currently in place is displayed. The glycemic target and the hypoglycemia protocol orders are still present in the background.

Note that you can now discontinue or revise any individual insulin, or you can ***adjust all insulins*** *if nutritional status changes or glycemic control is suboptimal.*

Example 2 — Good Samaritan Regional Medical Center, Phoenix, Arizona
This example is courtesy of Cheryl O'Malley, MD, the local hospitalist champion at Good Samaritan. Note that a high degree of integration of institutional preferences and guidance can be incorporated in this environment with paper orders, just as it can be in the CPOE environment, in a previous example.



Banner Good Samaritan
Medical Center

PATIENT LABEL

BASAL INSULIN ORDER SET

PHYSICIANS See "Physicians Dosing Guideline for Subcutaneous Insulin" for initial doses)

Date: ________

All orders with "☒ "will be followed unless crossed out

Time: ________

1 **DISCONTINUE ORAL DIABETIC MEDICATIONS**
- ☐ Do Not Give ________________________________
- ☒ Discontinue Regular Insulin Sliding Scale if previously ordered

2 **MONITOR BLOOD GLUCOSE**
- ☒ Before every meal & HS OR every 4 hrs when NPO
- ☒ Lab – HgbA1C (unless already ordered this admission)
- ☒ For BS < 70, follow nursing hypoglycemic protocol

3 **LONG ACTING/BASAL INSULIN**

Physician choose one
See reverse for dosing guide

- ☐ **Glargine (Lantus) Insulin** _______ units at HS (2100 hours)
  - ☒ Give full dose EVEN if NPO, on clear or full liquids or eating <50% of their meal
- ☐ **NPH Insulin** _______ units AC Breakfast and ______units at HS
  - ☒ Give 50% of the dose if NPO

4 **RAPID ACTING/BOLUS INSULIN**

A **Scheduled Nutritional/Meal Humalog Insulin Orders**
- ☒Administer within 30 minutes of the start of the meal or tube feed
- ☒ Hold if they are made NPO, on clear or full liquids, or eating < 50% of the meal
- ☒Do not give if tube feeds or TPN stopped

1 **Patient eating solid foods OR on bolus tube feeds**
- ☒ If blood sugar <70, decrease dose by 50% and give at the completion of meal

Physician choose one
See reverse for dosing guide

- ☐ With each meal give __________ units **Humalog subq** (do not give at HS),

OR

- ☐Immediately after each meal, give 1 unit **Humalog subq** per _________grams of carbohydrate (15 grams = 1 CHO exchange)

2 **Continuous tube feeds or TPN**
- ☐Every 4 hr, give ____ units **Humalog subq**

B **Supplemental Humalog Insulin Orders In addition to scheduled nutritional insulin**
- ☒ Do not give at bedtime
- ☒Continue to give if NPO but use the scale for BMI <25

Physician choose one
See reverse for dosing guide

- ☐By Scale Below **(In general, exclusive use of this scale is discouraged)**

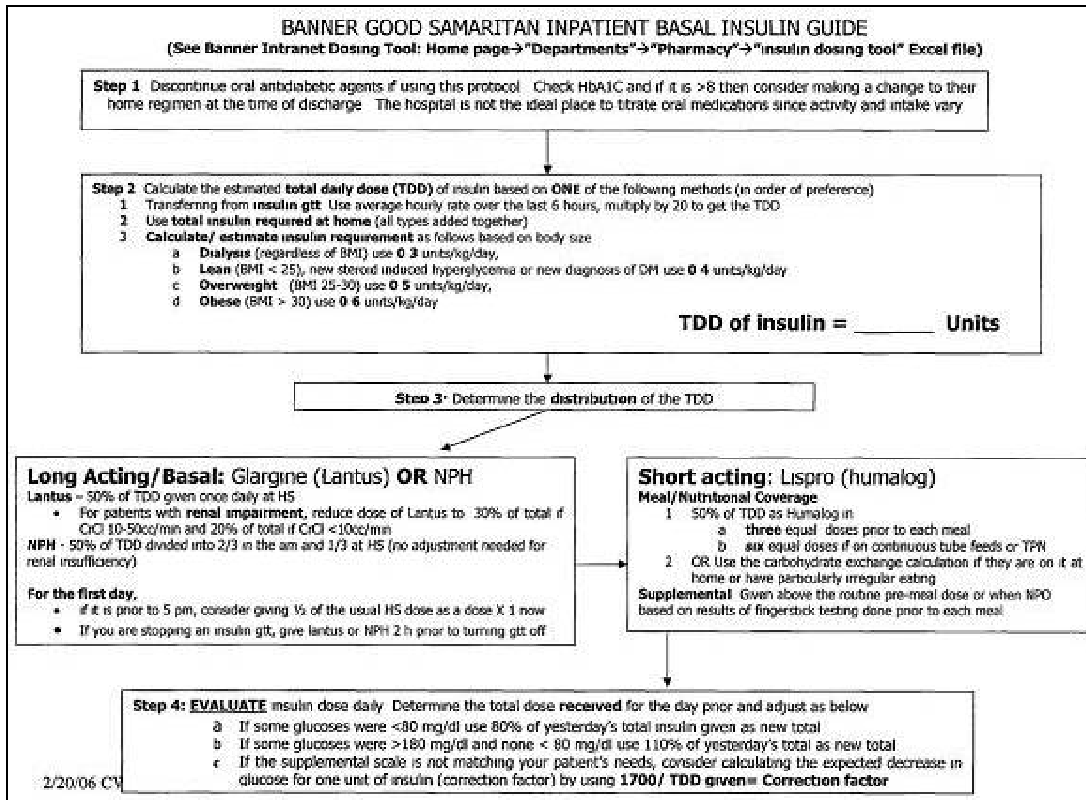
OR

- ☐(Blood Sugar - 120)/correction factor________ = number of supplemental units

Glucose	☐ BMI <25, NPO, or on Dialysis	☐BMI 25-30	☐BMI > 30	☐OTHER
<70	Follow Nursing Hypoglycemia Protocol + reduce scheduled dose of humalog by 50%			
70-150 mg/dl	No change	No change	No change	
151-175 mg/dl	+ 1 unit humalog	+ 2 units humalog	+ 3 units humalog	
176-200 mg/dl	+ 2 units humalog	+ 4 units humalog	+ 5 units humalog	
201-225 mg/dl	+ 3 units humalog	+ 6 units humalog	+ 7 units humalog	
226-250 mg/dl	+ 5 units humalog	+ 8 units humalog	+ 9 units humalog	
251-275 mg/dl	+ 7 units humalog	+ 10 units humalog	+ 11 units humalog	
276-300 mg/dl	+ 9 units humalog	+ 12 units humalog	+ 14 units humalog	
> 300mg/dl	+ 12 units humalog	+ 14 units humalog	+ 18 units humalog	
	No humalog at bedtime	No humalog at bedtime	No humalog at bedtime	No humalog

Physician Signature ____________________________________ Pager #___________

Revised 02/20/06



BANNER GOOD SAMARITAN INPATIENT BASAL INSULIN GUIDE

(See Banner Intranet Dosing Tool: Home page→"Departments"→"Pharmacy"→"insulin dosing tool" Excel file)

Step 1 Discontinue oral antidiabetic agents if using this protocol Check HbA1C and if it is >8 then consider making a change to their home regimen at the time of discharge The hospital is not the ideal place to titrate oral medications since activity and intake vary

Step 2 Calculate the estimated **total daily dose (TDD)** of insulin based on **ONE** of the following methods (in order of preference)

1. Transferring from **insulin gtt** Use average hourly rate over the last 6 hours, multiply by 20 to get the TDD
2. Use **total insulin required at home** (all types added together)
3. **Calculate/ estimate insulin requirement** as follows based on body size
   - a **Dialysis** (regardless of BMI) use **0 3** units/kg/day,
   - b **Lean** (BMI < 25), new steroid induced hyperglycemia or new diagnosis of DM use **0 4** units/kg/day
   - c **Overweight** (BMI 25-30) use **0 5** units/kg/day,
   - d **Obese** (BMI > 30) use **0 6** units/kg/day

TDD of insulin = ______ Units

Step 3· Determine the **distribution** of the TDD

Long Acting/Basal: Glargine (Lantus) **OR** NPH

Lantus – 50% of TDD given once daily at HS

- For patients with **renal impairment**, reduce dose of Lantus to 30% of total if CrCl 10-50cc/min and 20% of total if CrCl <10cc/min

NPH - 50% of TDD divided into 2/3 in the am and 1/3 at HS (no adjustment needed for renal insufficiency)

For the first day,

- if it is prior to 5 pm, consider giving ½ of the usual HS dose as a dose X 1 now
- If you are stopping an insulin gtt, give lantus or NPH 2 h prior to turning gtt off

Short acting: Lispro (humalog)

Meal/Nutritional Coverage

1. 50% of TDD as Humalog in
   - a **three** equal doses prior to each meal
   - b **six** equal doses if on continuous tube feeds or TPN
2. OR Use the carbohydrate exchange calculation if they are on it at home or have particularly irregular eating

Supplemental Given above the routine pre-meal dose or when NPO based on results of fingerstick testing done prior to each meal

Step 4: <u>EVALUATE</u> insulin dose daily Determine the total dose **received** for the day prior and adjust as below

- a If some glucoses were <80 mg/dl use 80% of yesterday's total insulin given as new total
- b If some glucoses were >180 mg/dl and none < 80 mg/dl use 110% of yesterday's total as new total
- c If the supplemental scale is not matching your patient's needs, consider calculating the expected decrease in glucose for one unit of insulin (correction factor) by using **1700/ TDD given= Correction factor**

2/20/06 CV

These materials can be found in Appendix H of the Glycemic Control Implementation Guide

Banner Good Samaritan
Medical Center

PHYSICIANS DOSING GUIDELINES FOR SUBCUTANEOUS INSULIN

TARGET Preprandial <140, <180 at all times Hyperglycemia increases risk for mortality, infection, overall morbidity and length of stay For OB and ICU patients the targets and methods are different so generally IV insulin is preferred

Estimating Insulin Doses

A If patient without known diabetes, then assume low insulin requirements initially

B In known type 2 diabetics whose outpatient blood sugars were controlled with diet alone, supplemental scale may be sufficient to control blood sugars in the hospital

First Day

- **For the first day,**
  - if it is prior to 5 pm, consider giving ½ of the usual HS dose X 1 then usual hs dose
  - If it is after 5 pm, consider giving the hs dose of long acting insulin early
- **If you are stopping an insulin gtt, give glargine (lantus) or NPH 2 h prior to turning gtt off**

Special Situations

A Type I diabetics require at least some scheduled insulin at **all times** to prevent ketosis, even when NPO
- Many times, you can use the regimen the patient has at home including basal and meal insulin
- Sliding scale insulin as the only coverage should not be used

B TPN:
- For TPN and other dextrose containing fluids 1 unit of insulin usually covers 10 grams of dextrose
- 80% of the total daily dose of insulin should be placed in the TPN bag as regular insulin and adjusted daily this will allow for continuous infusion matched with the TPN infusion

C For Nocturnal Enteral Feeds
- Monitor blood sugars every 4 hours for the first few nights with supplemental scale coverage After the dosing is determined, give a short acting insulin at the start of the tube feeds to cover the first several hours along with NPH to cover the rest of the night

D Corticosteroids affect carbohydrate metabolism and characteristically leads to more exaggerated postprandial hyperglycemia
- Consider changing the ratio from 50% of TDD Basal/50% TDD bolus (meal) to 30% basal and 70% with meals
- If on once daily oral steroids then consider using NPH as the basal insulin and dosing it around the steroid dose

E Cystic Fibrosis Due to nutritional needs, they should be on a regular diet with supplementation Because of the higher caloric intake, carbohydrate counting and correction factor calculation are the most physiologic, many patients will not need basal insulin

NHLBI Body Mass Index Table

	Lean						Overweight					Obese				
BMI	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
Height (ft in)																
4'10"	91	96	100	105	110	115	119	124	129	134	138	143	145	153	158	162
4'11"	94	99	104	109	114	119	124	128	133	138	143	148	153	158	163	168
5'	97	102	107	112	118	123	128	133	138	143	148	153	158	163	168	174
5'1"	100	106	111	116	122	127	132	137	143	148	153	155	164	169	174	180
5'2"	104	109	115	120	126	131	136	142	147	153	158	164	169	175	180	186
5'3"	107	113	118	124	130	135	141	146	152	158	163	169	175	180	186	191
5'4"	110	116	122	128	134	140	145	151	157	163	169	174	180	186	192	197
5'5"	114	120	126	132	138	144	150	156	162	168	174	180	186	192	198	204
5'6"	118	124	130	136	142	148	155	161	167	173	179	186	192	198	204	210
5'7"	121	127	134	140	145	153	159	166	172	178	185	191	198	204	211	217
5'8"	125	131	138	144	151	158	164	171	177	184	190	197	203	210	216	223
5'9"	128	135	142	149	155	162	169	176	182	189	196	203	209	216	223	230
5'10"	132	139	146	153	160	167	174	181	188	195	202	209	216	222	229	236
5'11"	136	143	150	157	165	172	179	186	193	200	208	215	222	229	236	243
6'	140	147	154	162	169	177	184	191	199	206	213	221	228	235	242	250
6'1"	144	151	159	166	174	182	189	197	204	212	219	227	235	242	250	257
6'2"	148	155	163	171	179	186	194	202	210	218	225	233	241	249	256	264
6'3"	152	160	168	176	184	192	200	208	216	224	232	240	248	256	264	272
6'4"	156	164	172	180	189	197	205	213	221	230	238	246	254	263	271	279

Example 3 — University of California, San Francisco

This example is courtesy of the University of California, San Francisco, and Dr. Robert Rushakoff. You can again see the high degree of guidance that can be incorporated into your order sets,

regardless of whether you are in a paper-based or CPOE ordering environment.

Specifically, note:

- Guidance on optimal monitoring is available with check box simplicity.
- The decision to use one rapid-acting analogue as the nutritional and correction-dose insulin of choice drives the timing of the monitoring suggestions.
- Lower correction-dose scale available for qHS and early AM glucose excursions.
- Incorporation of a hypoglycemia protocol.
- Admonition not to mix glargine (Lantus) with other insulins.
- Dosing guidance and plentiful suggestions on strategies for special situations.

UCSF Medical Center

Orders must be written in black or blue ink. Nurse transcribing orders will indicate the transcription by signing their name and classification, the date and time the transcribing is completed. When an order is discontinued, write "Discontinue" giving date and naming order.

UNIT NUMBER
PT NAME
BIRTHDATE
LOCATION DATE

ADULT SUBCUTANEOUS INSULIN ORDER SHEET

Insulin allergy: ☐ Yes ☐ No

BLOOD GLUCOSE GOAL IS 80-150 MG/DL

"√" in box activates order

1. BLOOD GLUCOSE (BG) MONITORING:
   ☐ Patient Eating – BEFORE meals, at bedtime, and 2 a.m.
   ☐ NPO – Every 4 hours
   ☐ Tube Feeds, TPN – Every 4 hours

2. BASAL AND NUTRITIONAL INSULIN DOSE (IN UNITS): Hold nutritional dose of Aspart if patient becomes NPO or tube feed held but give correctional insulin if required.

Tube Feeds TIME	8 a.m.	12 p.m.	4 p.m.	8 p.m.	12 a.m.	4 a.m.
Patient Eating TIME	Breakfast	Lunch	Dinner	Bedtime		
Aspart (NovoLog)						
NPH						
Glargine (Lantus)						
NovoLog Mix 70/30						

3. CORRECTIONAL INSULIN with Aspart: Choose: ☐ Meals –OR– ☐ Every 4 hrs (Tube feed, TPN, NPO)

MEALS OR EVERY 4 HRS	BG Range:	Default Value: to add or subtract from nutritional dose of Aspart Insulin (Use unless numbers are entered in next column as "Individualized Dose".)	Or Individualized Dose
	<70 mg/dL	Treat for Hypoglycemia per protocol (see #6 below). Once BG ≥ 100 mg/dL, give insulin 2 units less when patient eats	
	71-100 mg/dL	-1 unit	- ______
	101-150 mg/dL	Give nutritional dose Aspart as in #2 above	
	151-200 mg/dL	+ 1 unit	+ ______
	201-250 mg/dL	+ 2 units	+ ______
	251-300 mg/dL	+ 3 units	+ ______
	301-350 mg/dL	+ 4 units	+ ______
	351-400 mg/dL	+ 5 units	+ ______
	over 400 mg/dL	+ 6 units	+ ______

4. Bedtime and 2 am high blood glucose correction with Aspart. (Not for tubefeed, TPN, or NPO.) Patients on tubefeed, TPN, or NPO follow orders number 2 and 3 as above.)

BEDTIME AND 2AM	BG Range:	Default Value (use unless numbers are centered in next column as "Individual Dose")	Or Individualized Dose
	200-250 mg/dL	1 unit	
	251-300 mg/dL	2 units	
	>300 mg/dL	3 units	

5. CALL MD for BG < 70 mg/dL or 400 mg/dL. Call MD when patient is NPO>4 hours for an IV Dextrose order.
6. For BG < 70 mg/dL, use Hypoglycemia Protocol below:
   For patient taking PO, give 20 gm of oral fast-acting carbohydrate:
   ☑ Give 4 glucose tablets (5 gram glucose/tablet)
   -OR-
   ☑ Give 6 oz. fruit juice
   ☑ Give 25 mL D50 IV push if patient cannot take PO
   ☑ Check fingerstick glucose every 15 minutes and repeat above treatment until BG is ≥ 100 mg/dL.

NOTE: Aspart and NOVOLOG 70/30 MIX should be given immediately before meal (when meal is present).
Glargine (Lantus) CANNOT be mixed with any other insulin. Give Glargine as a separate injection.
If patient is on tube feeds, give insulin at the start of tube feeds.

Signature ______ M.D. # ___ ___ ___ ___ ___ Time ______ Date ______ Pager # ______

FLAG CHART TO INDICATE NEW ORDER — Checked by ______ R.N. Time ______ Date ______

ADULT SUBCUTANEOUS INSULIN ORDER SHEET

PROOF ONLY

Endocrine fellow 443-9125
Diabetes Nurse Specialist 443-2951

Adult Inpatient Insulin Dosing Guidelines

Basal - amount of insulin needed when patient is not eating (use NPH or Glargine – dose ~ 0.1 to 0.4 units/kg/day).
Nutritional - insulin for food or TPN or tube feeds. Hospital meals 60-75 grams carbohydrates per meal.
Correctional - insulin for high BG – to bring BG to target range of 150mg/dl premeals and 200mg/dl bedtime, 2am.

Insulin Regimens

I. **Patient controlled on diet only at home but needs insulin in hospital because of hyperglycemia.**
   Day 1: 1) Write correctional with Aspart based on BMI - refer to Table 1.
   Day 2: 1) If BG pre meals >150mg, add nutritional insulin with Aspart based on appetite - refer to Table 2.
   2) If FBG>150mg, add Basal insulin NPH or Lantus 0.1 unit per kg body weight.
   Day 3: 1) Adjust insulin dosing based on BG pattern. Increase or decrease basal (Lantus, NPH) based on FBG. Adjust nutritional (Aspart) needs based on premeal BG levels.

II. **Patient on oral agent at home but requiring insulin in hospital because of hyperglycemia or difficulties using the oral agents in the hospital.**
   Day 1: 1) Start Aspart TID based on appetite – refer to Table 2.
   2) Write correction with Aspart based on BMI – refer to Table 1.
   Day 2: 1) If FBG >150mg, add basal, start NPH/Glargine 0.1 unit/kg at bedtime.

Table 1. Correctional Aspart insulin (Write in section 3 of SC Insulin Order Sheet.)

Blood Glucose	Normal, BMI < 25	Overweight BMI 25-30	Obese > 30
PREMEAL			
150-200	1 unit	2 units	3 units
201-250	2 units	4 units	6 units
250-300	3 units	6 units	9 units
301-350	4 units	8 units	12 units
351-400	5 units	10 units	15 units
> 400	6 units	12 units	18 units
BEDTIME, 2AM			
200-250	1 unit	2 units	3 units
250-300	2 units	3 units	4 units
> 300	3 units	4 units	5 units

Table 2. Nutritional Aspart insulin (Write in section 2 of SC Insulin Order Sheet.)

Appetite	Aspart (or Regular) pre meals
Not eating	0 units
Eats < 50%	1 unit
Eats 50-75%	2 units
Eats > 75%	3 units

III. **Patient on insulin at home.**
   1. Assess home BG control, appetite, creatinine, hypoglycemia.
   2. Basal Need: continue home regimen if satisfactory or start 0.2 units/kg insulin glargine or NPH.
   3. Nutritional Need: Aspart with dose based on appetite – refer to Table 2.
   4. Correctional: write correction if BG >150mg based on BMI – refer to Table 1.

IV. **Patient NPO Procedure**
   1. Decrease a.m. NPH dose by 50%; decrease a.m. glargine by 25%; hold nutritional insulin and oral agents.
   2. At bedtime, give same dose NPH, decrease Glargine dose by 25%.
   3. If NPO >4 hours, hang D5 at 50 –100ml/hour.
   4. High glucose correction every 4 hours with Aspart if BG >150mg – refer to Table 1.

V. **NPO Surgery**
   1. Use insulin infusion ICU form #602-068; Med-Surg Form #602-028.
   2. Need maintenance IV Dextrose (minimum rate 10ml/h).
   3. If TPN/tube feed interrupted, hang D10 at rate of tube feed/TPN.
   4. Give SQ insulin at least 30 minutes prior to D/C insulin infusion.

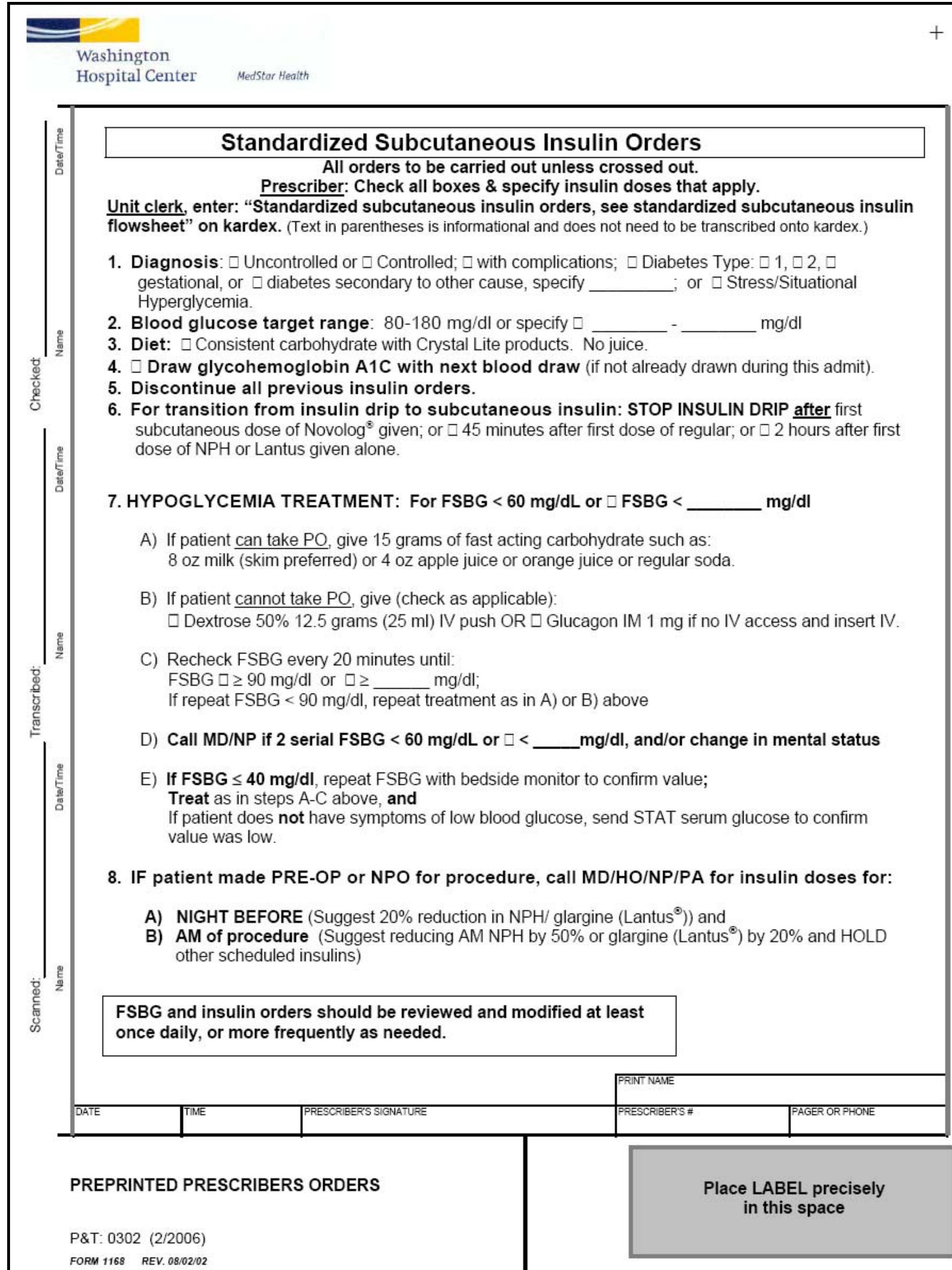
IV. **Transition to SQ insulin from Insulin Infusion**
   Patient Eating
   1. Calculate the total 24 hour insulin infused – use the lowest value – this is the total daily dose.
   2. Basal Need – divide Total Daily Dose by 2.5 for Glargine dose.
   3. Nutritional Need – divide Total Daily Dose by 7 for Aspart dose pre meals; if appetite poor use Table 2.
   4. Correctional – write if BG >150mg – Based on BMI – refer to Table 1.
   Tube Feed
   1. Calculate the total 24 hour insulin infused – use the lowest value – this is the total daily dose.
   2. Basal Need – divide Total Daily Dose by 2 for Glargine dose.
   3. Nutritional Need – divide Total Daily Dose by 10 for Aspart dose every 4 hours.
   4. Correctional – write if BG >150mg every 4 hours – Based on BMI – refer to Table 1.

PROOF ONLY

These materials can be found in Appendix H of the Glycemic Control Implementation Guide

Example 4 — Washington Hospital Medical Center

The example on the next two pages is brought to us by Michelle Magee, MD, from Washington Hospital Medical Center and the MedStar Health Institute. It incorporates many core components of the ideal SQ insulin order set, including specification of the DM diagnosis, A1C order, FSBG frequency, hypoglycemia treatment, and basal-bolus plus correction-dose orders, *and* makes allowance for eating, NPO, tube feeds, and transition from IV to SQ insulin order. The first page is only used once. The second page is the core insulin-ordering page. The prescriber rips off the first page and uses only the second for subsequent orders.



Washington Hospital Center MedStar Health

Date/Time Name Checked: Date/Time Name Transcribed: Date/Time Name Scanned:

Standardized Subcutaneous Insulin Orders

All orders to be carried out unless crossed out.

Prescriber: Check all boxes & specify insulin doses that apply.

Unit clerk, enter: "Standardized subcutaneous insulin orders, see standardized subcutaneous insulin flowsheet" on kardex. (Text in parentheses is informational and does not need to be transcribed onto kardex.)

1. **Diagnosis**: ☐ Uncontrolled or ☐ Controlled; ☐ with complications; ☐ Diabetes Type: ☐ 1, ☐ 2, ☐ gestational, or ☐ diabetes secondary to other cause, specify _________; or ☐ Stress/Situational Hyperglycemia.
2. **Blood glucose target range**: 80-180 mg/dl or specify ☐ ________ - ________ mg/dl
3. **Diet:** ☐ Consistent carbohydrate with Crystal Lite products. No juice.
4. ☐ **Draw glycohemoglobin A1C with next blood draw** (if not already drawn during this admit).
5. **Discontinue all previous insulin orders.**
6. **For transition from insulin drip to subcutaneous insulin: STOP INSULIN DRIP after** first subcutaneous dose of Novolog® given; or ☐ 45 minutes after first dose of regular; or ☐ 2 hours after first dose of NPH or Lantus given alone.

7. HYPOGLYCEMIA TREATMENT: For FSBG < 60 mg/dL or ☐ FSBG < ________ mg/dl

A) If patient can take PO, give 15 grams of fast acting carbohydrate such as: 8 oz milk (skim preferred) or 4 oz apple juice or orange juice or regular soda.

B) If patient cannot take PO, give (check as applicable): ☐ Dextrose 50% 12.5 grams (25 ml) IV push OR ☐ Glucagon IM 1 mg if no IV access and insert IV.

C) Recheck FSBG every 20 minutes until: FSBG ☐ ≥ 90 mg/dl or ☐ ≥ ______ mg/dl; If repeat FSBG < 90 mg/dl, repeat treatment as in A) or B) above

D) **Call MD/NP if 2 serial FSBG < 60 mg/dL or ☐ < _____mg/dl, and/or change in mental status**

E) **If FSBG ≤ 40 mg/dl**, repeat FSBG with bedside monitor to confirm value; **Treat** as in steps A-C above, **and** If patient does **not** have symptoms of low blood glucose, send STAT serum glucose to confirm value was low.

8. IF patient made PRE-OP or NPO for procedure, call MD/HO/NP/PA for insulin doses for:

A) NIGHT BEFORE (Suggest 20% reduction in NPH/ glargine (Lantus®)) and
B) AM of procedure (Suggest reducing AM NPH by 50% or glargine (Lantus®) by 20% and HOLD other scheduled insulins)

FSBG and insulin orders should be reviewed and modified at least once daily, or more frequently as needed.

PRINT NAME

DATE | TIME | PRESCRIBER'S SIGNATURE | PRESCRIBER'S # | PAGER OR PHONE

PREPRINTED PRESCRIBERS ORDERS

P&T: 0302 (2/2006)

FORM 1168 REV. 08/02/02

Place LABEL precisely in this space

Washington Hospital Center MedStar Health

SUBCUTANEOUS INSULIN ORDERS

Prescriber: Check all boxes & specify insulin doses that apply. Unit clerk, enter: "Standardized subcutaneous insulin CHANGE orders, see subcutaneous insulin flowsheet" on kardex. (Text in parentheses is informational and does not need to be transcribed onto kardex.)

ORDER DATE: __ - __ - ___ **TIME:** ______

1. Fingerstick blood glucose (FSBG) monitoring:

Eating	☐ NPO or continuous tube feeds	☐ Bolus tube feedings	☐ Other, specify* -
Before meals and hs	Every 6 hours Or ☐ every 4 hours	Prior to ☐ each Or ☐ every other tube feed	(*At least 4 FSBG daily)

Call MD/HO/NP/PA for two serial FSBG < 60 or FSBG ≥ 400, or specify ☐ __________ mg/dl.

2. DISCONTINUE ALL PREVIOUS INSULIN ORDERS.

3. All Scheduled and Correction dose insulin is to be given subcutaneously

4. SCHEDULED INSULINS

		0700-0900/Breakfast	1200-1300/Lunch	1700-1800/Dinner	2200/Bedtime
BASAL		Give _____ units of ☐ NPH ☐ glargine (Lantus®)		Give _____ units of ☐ NPH ☐ glargine (Lantus®)	Give ____ units of ☐ NPH ☐ glargine (Lantus®)
PRANDIAL (MEAL)		Give _____units of ☐ Aspart (Novolog®) ☐ Regular	Give _____units of ☐ Aspart (Novolog®) ☐ Regular	Give _____units of ☐ Aspart (Novolog®) ☐ Regular	
		(Tray must be ON FLOOR (Regular) or AT BEDSIDE (Novolog®) when meal/prandial insulin dose given)			
PRE-MIXED		☐ Give ___units of NovoLOG 70/30		☐ Give ____units of NovoLOG 70/30	
TUBE FEEDING	BOLUS	Give ___units of: ☐ Aspart (Novolog®); -or- ☐ Regular, With: ☐ each bolus or ☐ every other bolus (regular not to be given more then every 6 hours)			
	CONTINUOUS	Give ___ units of: ☐ Regular every 6 hours; Or ☐ Aspart (Novolog®) every 4 hours			
NPO		Give ___units of: ☐ Regular every 6 hours; or ☐ Aspart (Novolog®) every 4 hours			

5. CORRECTION DOSE INSULIN

For FSBG in below ranges, give ☐ Aspart (Novolog®) or ☐ Regular insulin in dose specified in selected column **in addition to scheduled insulin doses.** (Use low dose column if no other column selected)

From 0600 to 2359

Blood Glucose (mg/dl)	☐ Low Dose (Requires < 40 units insulin per day)	☐ Medium Dose (Requires 41-99 units insulin per day)	☐ High Dose (Requires > 100 units insulin per day)	☐ Individualized
150-199	1 unit	1 unit	2 units	____ units
200-249	2 units	3 units	4 units	____ units
250-299	3 units	5 units	7 units	____ units
300-349	4 units	7 units	10 units	____ units
>349	5 units	8 units	12 units	____ units

☐ **0000 to 0559/HS (OVERNIGHT) reduce above doses by 1/2** if patient on po diet or tube feeds held.

FSBG and Insulin orders should be reviewed and modified once daily or as needed

PRINT NAME

DATE	TIME	PRESCRIBER'S SIGNATURE	PRESCRIBER'S #	PAGER OR PHONE

Checked: Date/Time Name
Transcribed: Date/Time Name
Scanned: Date/Time Name

PREPRINTED PRESCRIBERS ORDERS

Place LABEL precisely in this space

P&T# 0302 (2/2006)

FORM 1168 REV. 08/02/02

These materials can be found in Appendix H of the Glycemic Control Implementation Guide