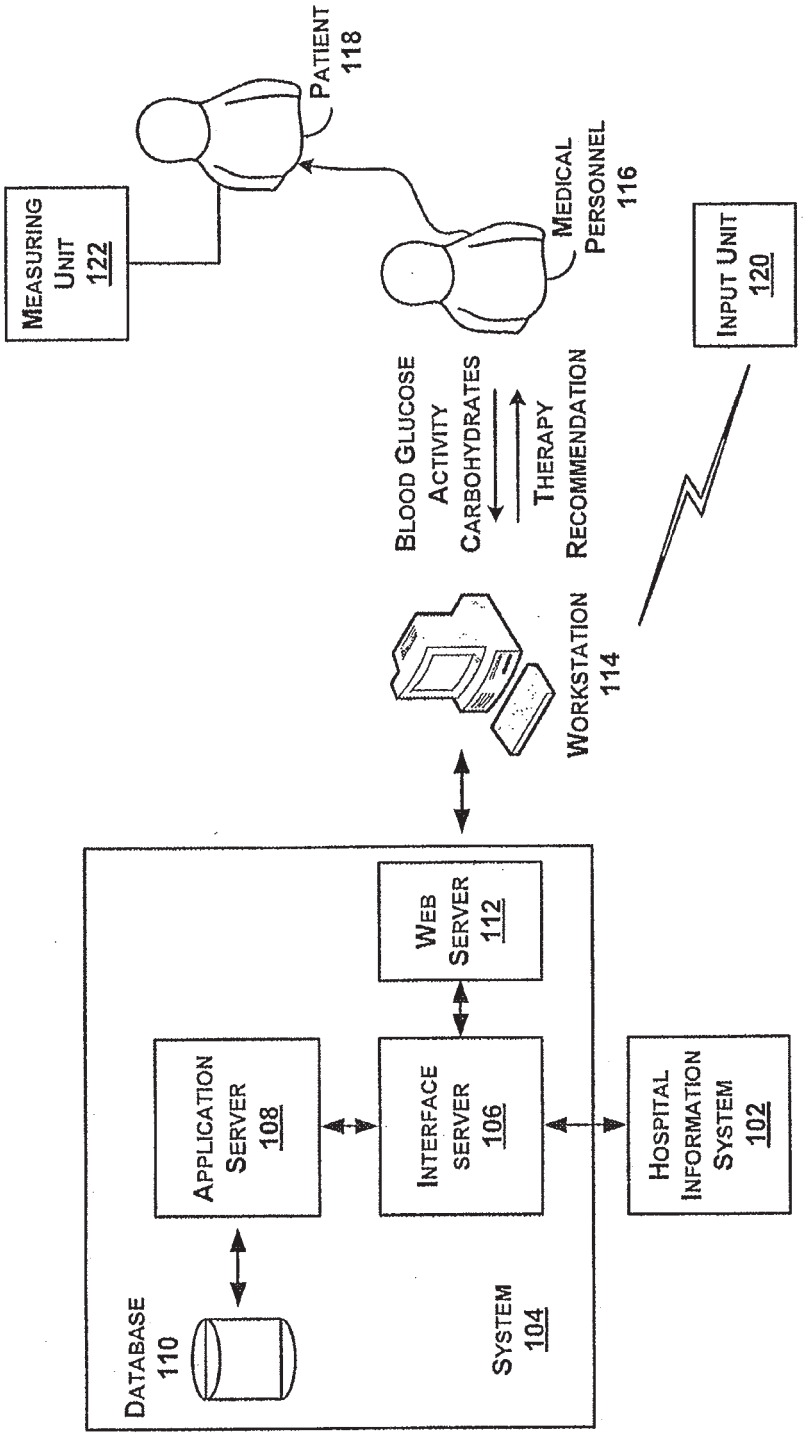

PATIENT
118
MEASURING UNIT
122
MEDICAL PERSONNEL
116
INPUT UNIT
120
BLOOD GLUCOSE
ACTIVITY
CARBOHYDRATES
THERAPY
RECOMMENDATION
WORKSTATION
114
WEB SERVER
112
APPLICATION SERVER
108
INTERFACE SERVER
106
HOSPITAL INFORMATION SYSTEM
102
DATABASE
110
SYSTEM
104

FIGURE 1

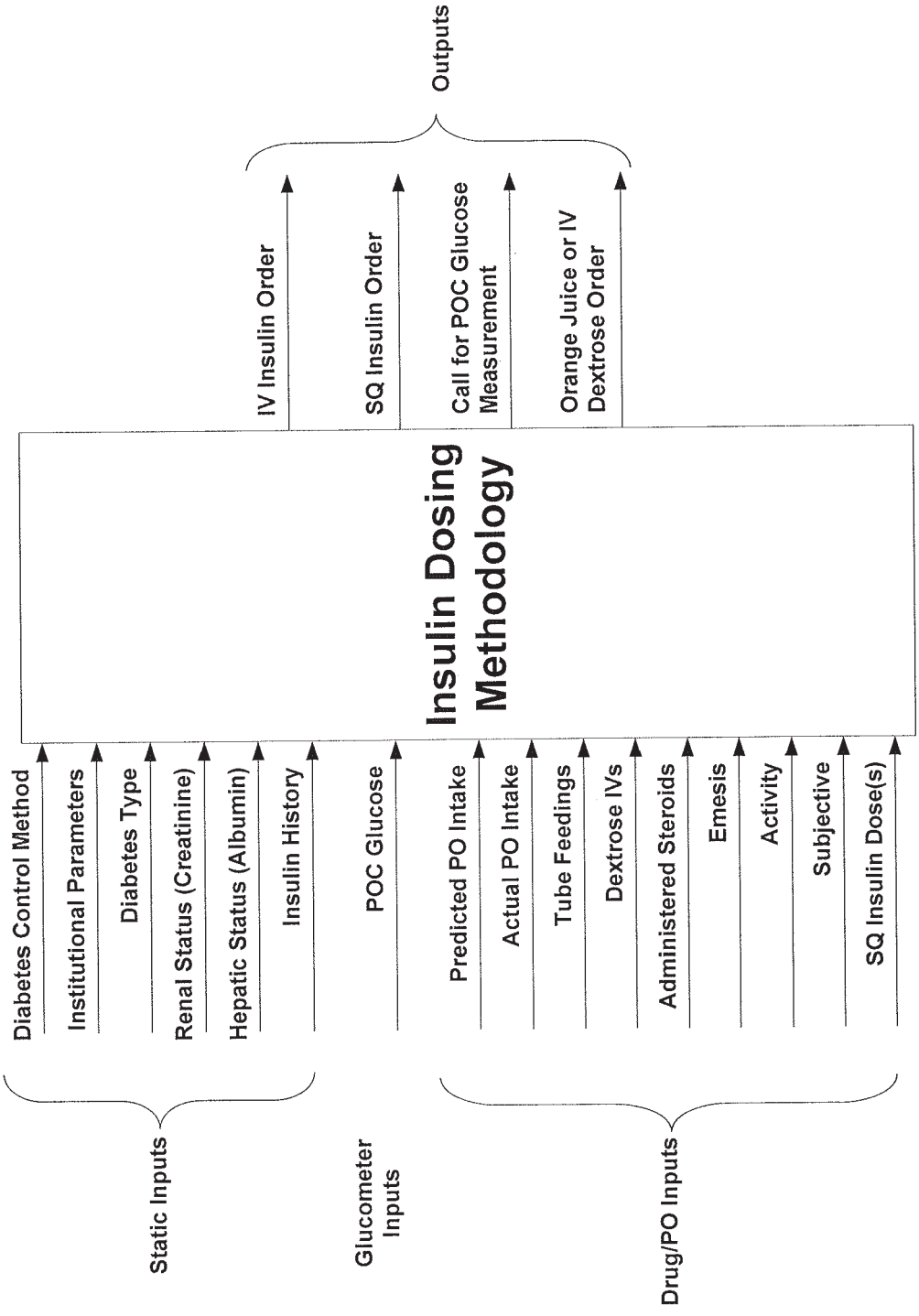

Outputs
IV Insulin Order
SQ Insulin Order
Call for POC Glucose Measurement
Orange Juice or IV Dextrose Order
Insulin Dosing Methodology
Diabetes Control Method
Institutional Parameters
Diabetes Type
Renal Status (Creatinine)
Hepatic Status (Albumin)
Insulin History
POC Glucose
Predicted PO Intake
Actual PO Intake
Tube Feedings
Dextrose IVs
Administered Steroids
Emesis
Activity
Subjective
SQ Insulin Dose(s)
Static Inputs
Glucometer Inputs
Drug/PO Inputs

FIGURE 2

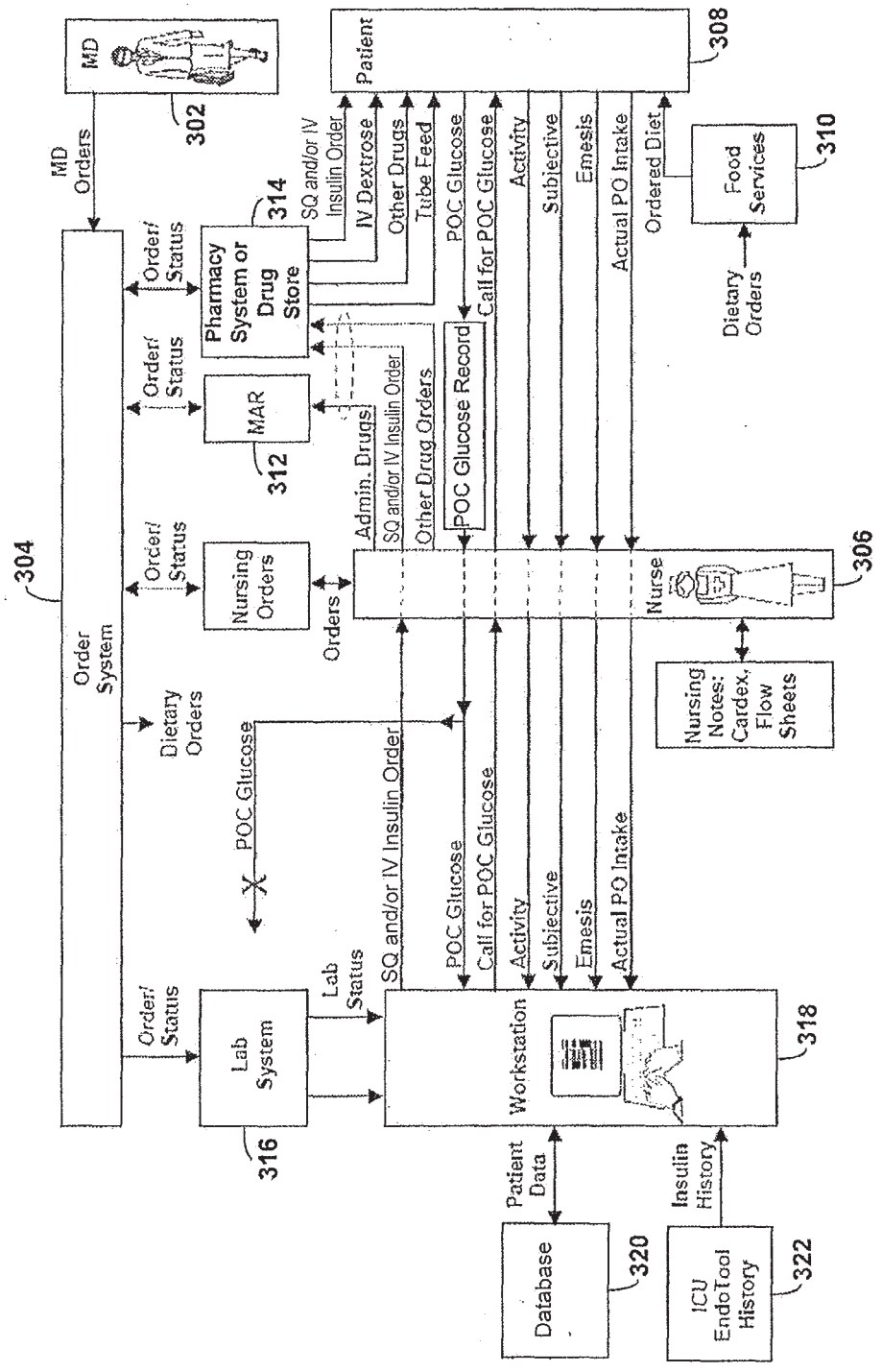

MD
302
MD Orders
304
Order System
Order/ Status
Lab System
316
Lab Status
Dietary Orders
POC Glucose
SQ and/or IV Insulin Order
Nursing Orders
Orders
Pharmacy System or Drug Store
314
MAR
312
Admin. Drugs
SQ and/or IV Insulin Order
Other Drug Orders
POC Glucose Record
Call for POC Glucose
Activity
Subjective
Emesis
Actual PO Intake
Ordered Diet
Patient
308
SQ and/or IV Insulin Order
IV Dextrose
Other Drugs
Tube Feed
POC Glucose
Food Services
310
Dietary Orders
Nurse
306
Nursing Notes: Cardex, Flow Sheets
Workstation
318
Patient Data
Database
320
Insulin History
ICU EndoTool History
322

FIGURE 3

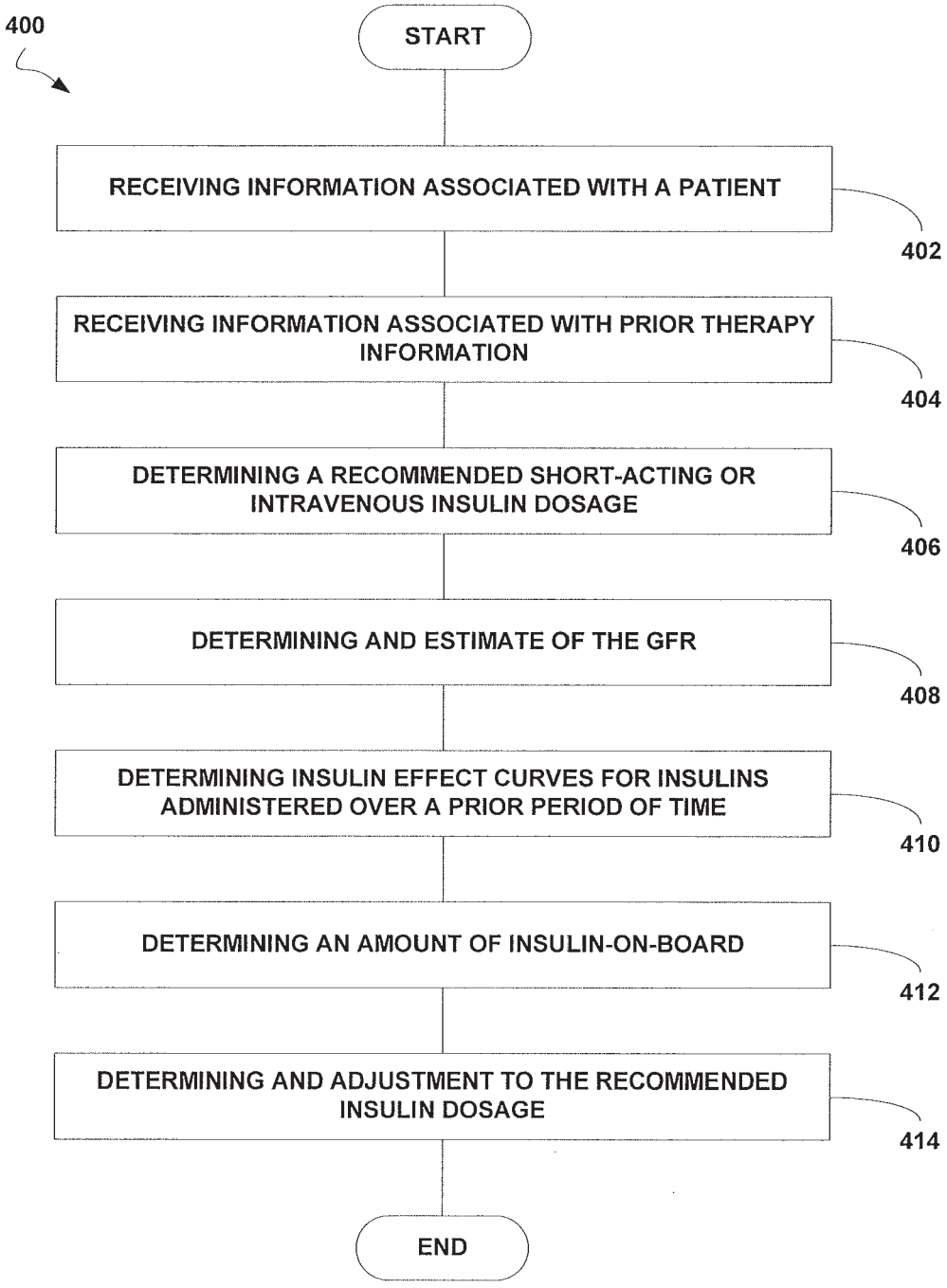

400
START
RECEIVING INFORMATION ASSOCIATED WITH A PATIENT
402
RECEIVING INFORMATION ASSOCIATED WITH PRIOR THERAPY INFORMATION
404
DETERMINING A RECOMMENDED SHORT-ACTING OR INTRAVENOUS INSULIN DOSAGE
406
DETERMINING AND ESTIMATE OF THE GFR
408
DETERMINING INSULIN EFFECT CURVES FOR INSULINS ADMINISTERED OVER A PRIOR PERIOD OF TIME
410
DETERMINING AN AMOUNT OF INSULIN-ON-BOARD
412
DETERMINING AND ADJUSTMENT TO THE RECOMMENDED INSULIN DOSAGE
414
END

FIGURE 4

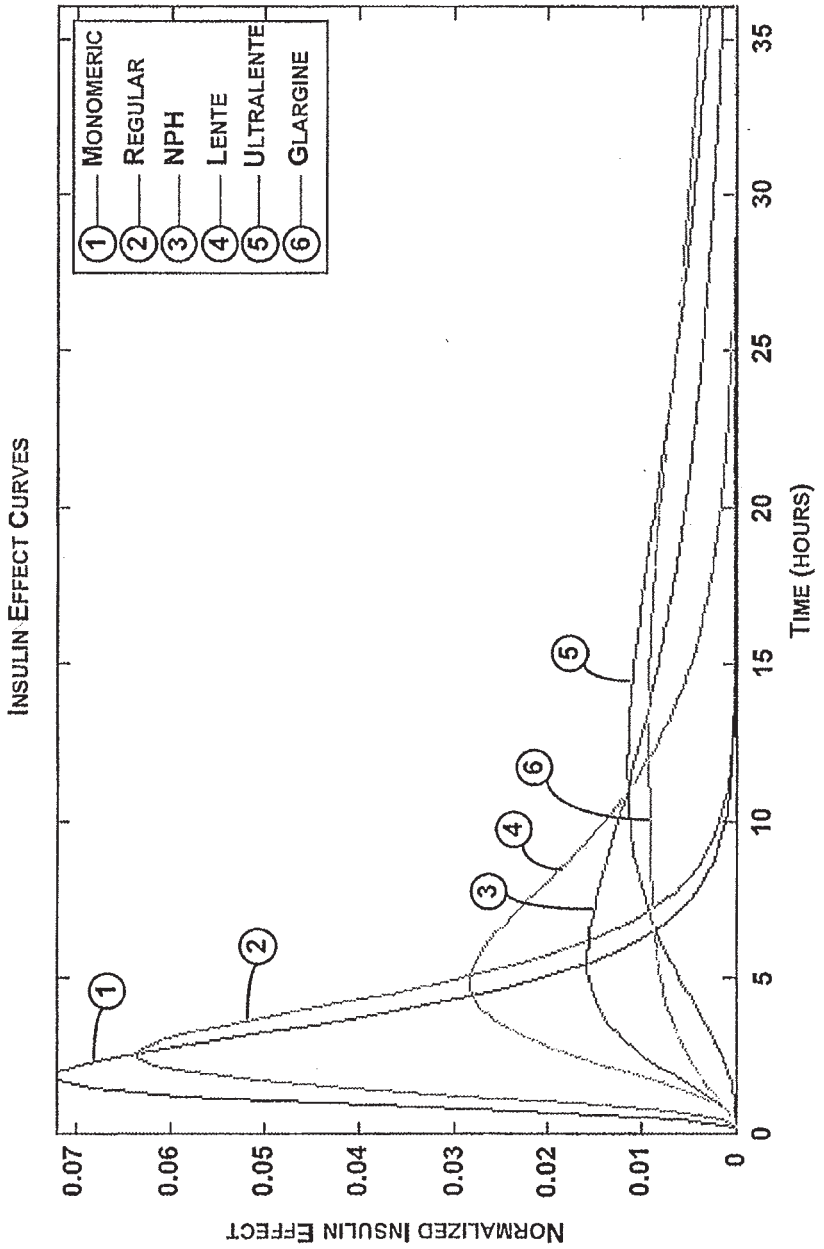

INSULIN EFFECT CURVES
NORMALIZED INSULIN EFFECT
TIME (HOURS)
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
0
5
10
15
20
25
30
35
1 MONOMERIC
2 REGULAR
3 NPH
4 LENTE
5 ULTRALENTE
6 GLARGINE

FIGURE 5

6/20

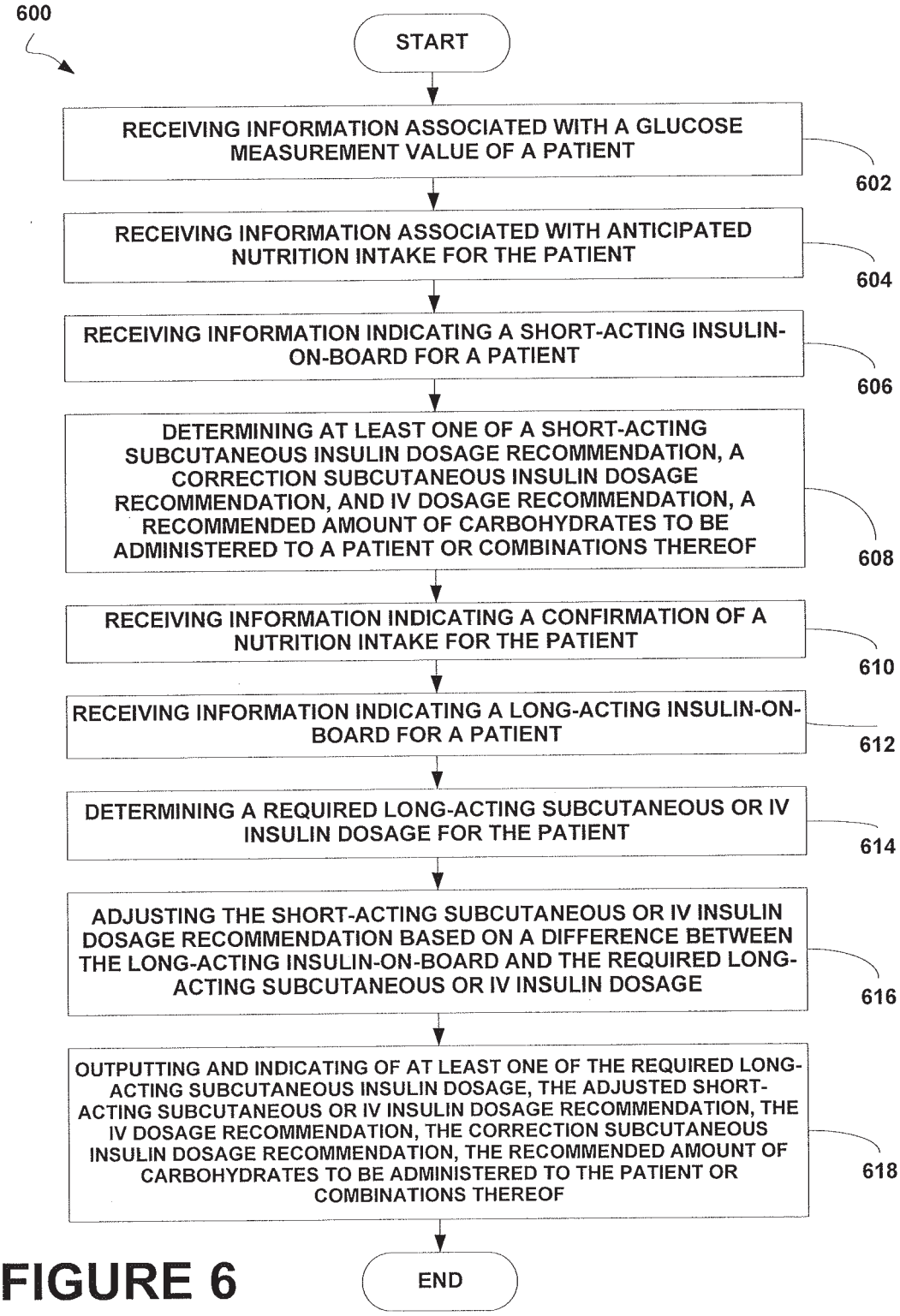

600
START
RECEIVING INFORMATION ASSOCIATED WITH A GLUCOSE MEASUREMENT VALUE OF A PATIENT
602
RECEIVING INFORMATION ASSOCIATED WITH ANTICIPATED NUTRITION INTAKE FOR THE PATIENT
604
RECEIVING INFORMATION INDICATING A SHORT-ACTING INSULIN-ON-BOARD FOR A PATIENT
606
DETERMINING AT LEAST ONE OF A SHORT-ACTING SUBCUTANEOUS INSULIN DOSAGE RECOMMENDATION, A CORRECTION SUBCUTANEOUS INSULIN DOSAGE RECOMMENDATION, AND IV DOSAGE RECOMMENDATION, A RECOMMENDED AMOUNT OF CARBOHYDRATES TO BE ADMINISTERED TO A PATIENT OR COMBINATIONS THEREOF
608
RECEIVING INFORMATION INDICATING A CONFIRMATION OF A NUTRITION INTAKE FOR THE PATIENT
610
RECEIVING INFORMATION INDICATING A LONG-ACTING INSULIN-ON-BOARD FOR A PATIENT
612
DETERMINING A REQUIRED LONG-ACTING SUBCUTANEOUS OR IV INSULIN DOSAGE FOR THE PATIENT
614
ADJUSTING THE SHORT-ACTING SUBCUTANEOUS OR IV INSULIN DOSAGE RECOMMENDATION BASED ON A DIFFERENCE BETWEEN THE LONG-ACTING INSULIN-ON-BOARD AND THE REQUIRED LONG-ACTING SUBCUTANEOUS OR IV INSULIN DOSAGE
616
OUTPUTTING AND INDICATING OF AT LEAST ONE OF THE REQUIRED LONG-ACTING SUBCUTANEOUS INSULIN DOSAGE, THE ADJUSTED SHORT-ACTING SUBCUTANEOUS OR IV INSULIN DOSAGE RECOMMENDATION, THE IV DOSAGE RECOMMENDATION, THE CORRECTION SUBCUTANEOUS INSULIN DOSAGE RECOMMENDATION, THE RECOMMENDED AMOUNT OF CARBOHYDRATES TO BE ADMINISTERED TO THE PATIENT OR COMBINATIONS THEREOF
618
END

FIGURE 6

7/20

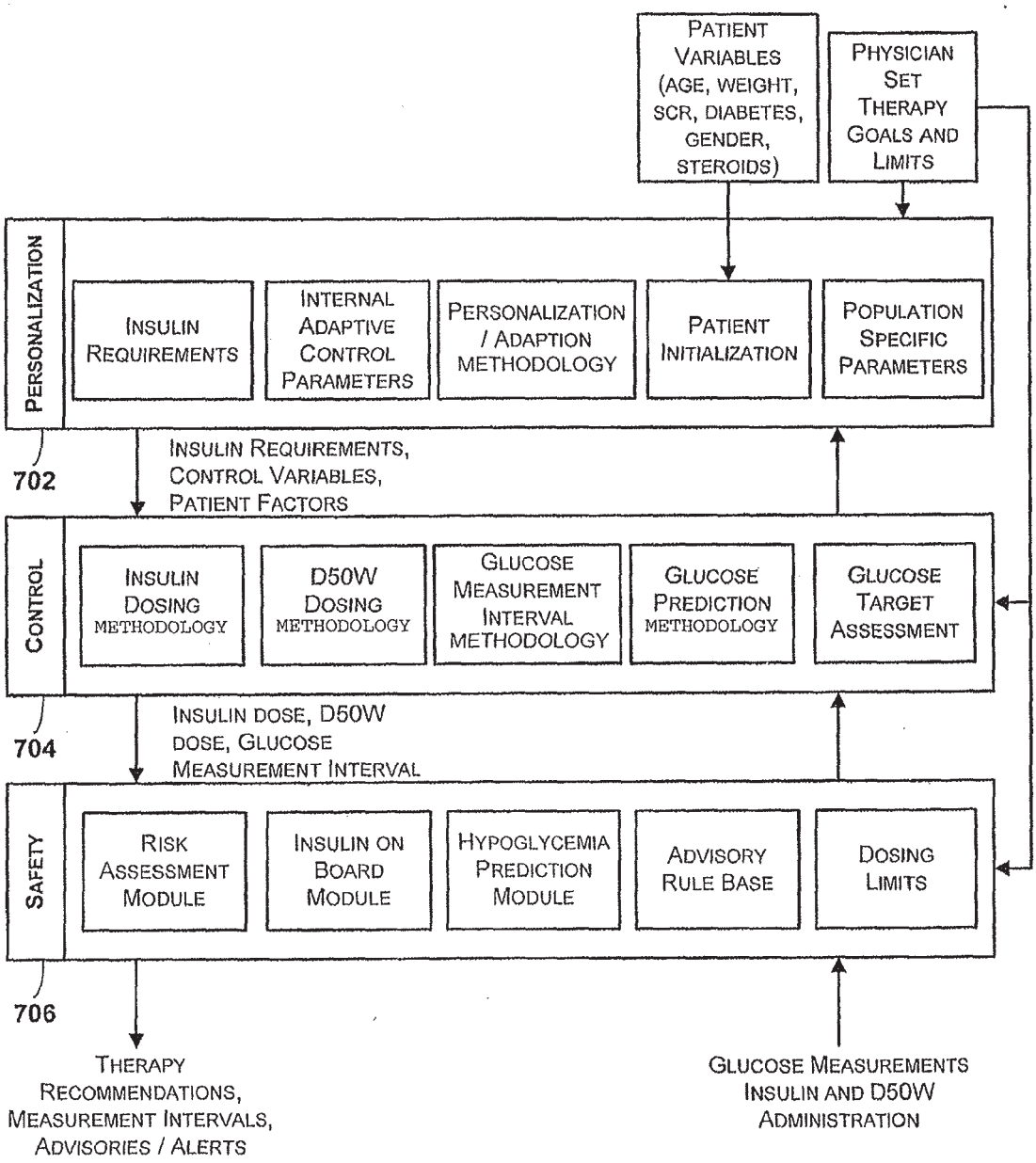

PATIENT VARIABLES (AGE, WEIGHT, SCR, DIABETES, GENDER, STEROIDS)
PHYSICIAN SET THERAPY GOALS AND LIMITS
PERSONALIZATION
INSULIN REQUIREMENTS
INTERNAL ADAPTIVE CONTROL PARAMETERS
PERSONALIZATION / ADAPTION METHODOLOGY
PATIENT INITIALIZATION
POPULATION SPECIFIC PARAMETERS
702
INSULIN REQUIREMENTS, CONTROL VARIABLES, PATIENT FACTORS
CONTROL
INSULIN DOSING METHODOLOGY
D50W DOSING METHODOLOGY
GLUCOSE MEASUREMENT INTERVAL METHODOLOGY
GLUCOSE PREDICTION METHODOLOGY
GLUCOSE TARGET ASSESSMENT
704
INSULIN DOSE, D50W DOSE, GLUCOSE MEASUREMENT INTERVAL
SAFETY
RISK ASSESSMENT MODULE
INSULIN ON BOARD MODULE
HYPOGLYCEMIA PREDICTION MODULE
ADVISORY RULE BASE
DOSING LIMITS
706
THERAPY RECOMMENDATIONS, MEASUREMENT INTERVALS, ADVISORIES / ALERTS
GLUCOSE MEASUREMENTS INSULIN AND D50W ADMINISTRATION

FIGURE 7

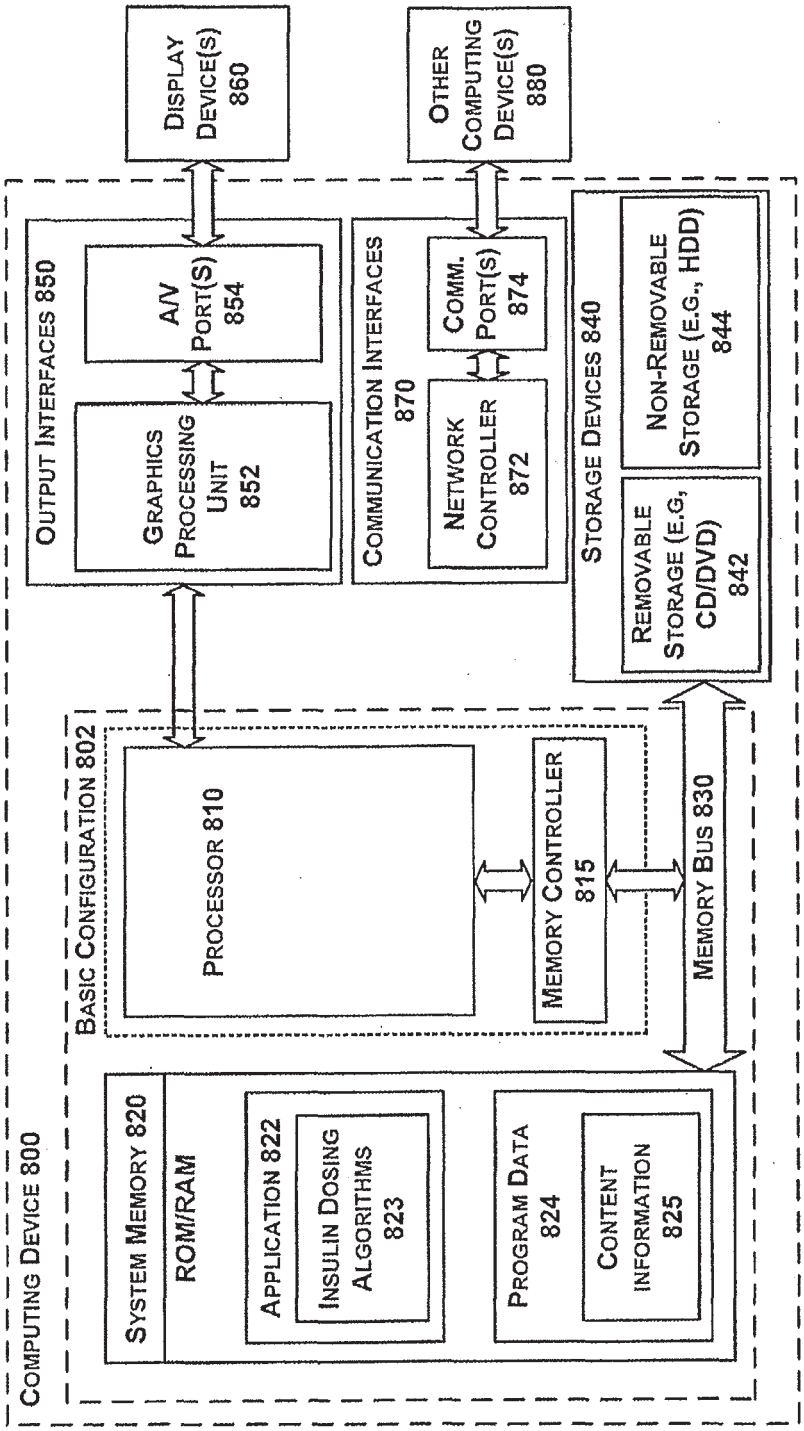

COMPUTING DEVICE 800
BASIC CONFIGURATION 802
PROCESSOR 810
MEMORY CONTROLLER 815
MEMORY BUS 830
SYSTEM MEMORY 820
ROM/RAM
APPLICATION 822
INSULIN DOSING ALGORITHMS 823
PROGRAM DATA 824
CONTENT INFORMATION 825
OUTPUT INTERFACES 850
GRAPHICS PROCESSING UNIT 852
A/V PORT(S) 854
COMMUNICATION INTERFACES 870
NETWORK CONTROLLER 872
COMM. PORT(S) 874
STORAGE DEVICES 840
REMOVABLE STORAGE (E.G., CD/DVD) 842
NON-REMOVABLE STORAGE (E.G., HDD) 844
DISPLAY DEVICE(S) 860
OTHER COMPUTING DEVICE(S) 880

FIGURE 8

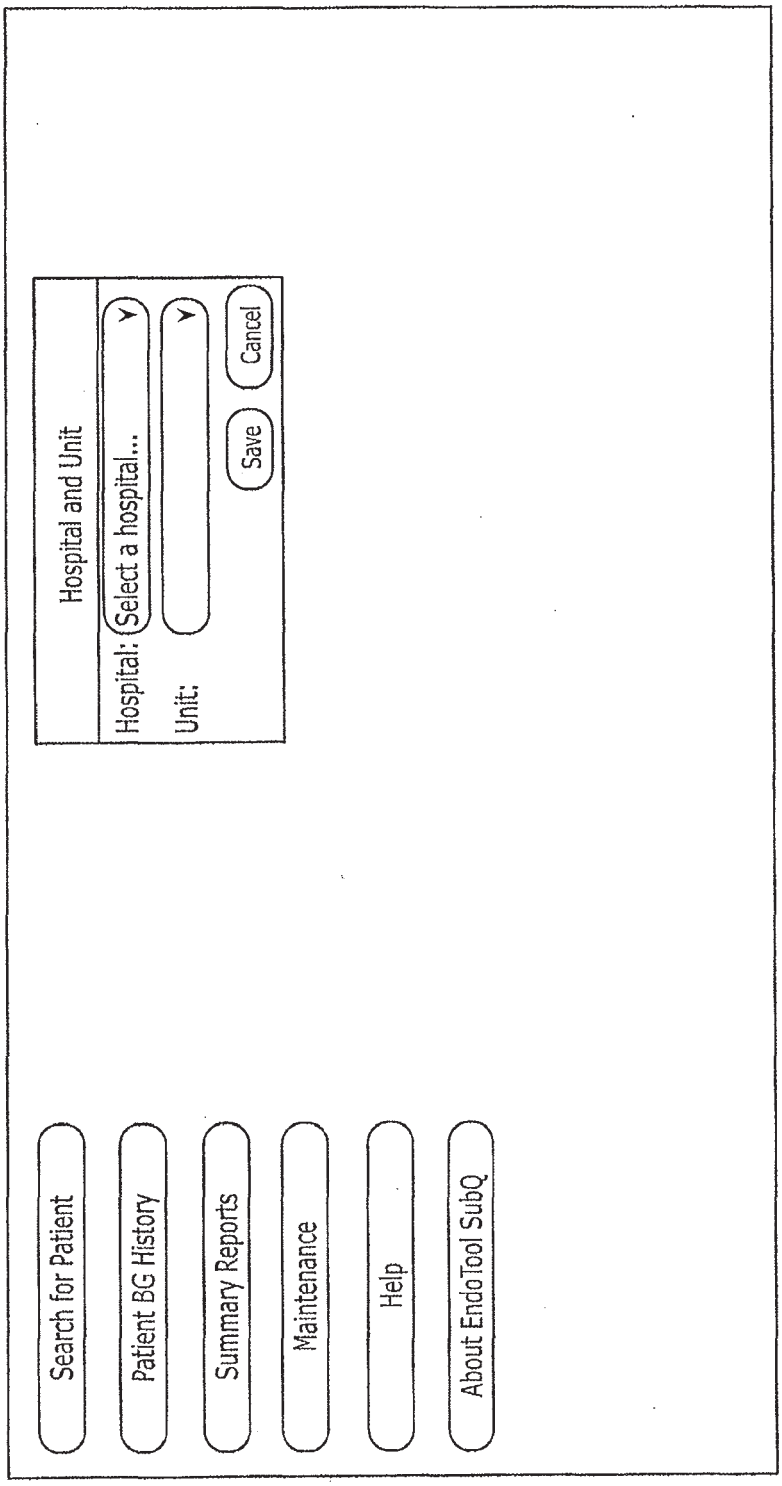

Search for Patient
Patient BG History
Summary Reports
Maintenance
Help
About EndoTool SubQ
Hospital and Unit
Hospital:
Select a hospital...
Unit:
Save
Cancel

FIG. 9A

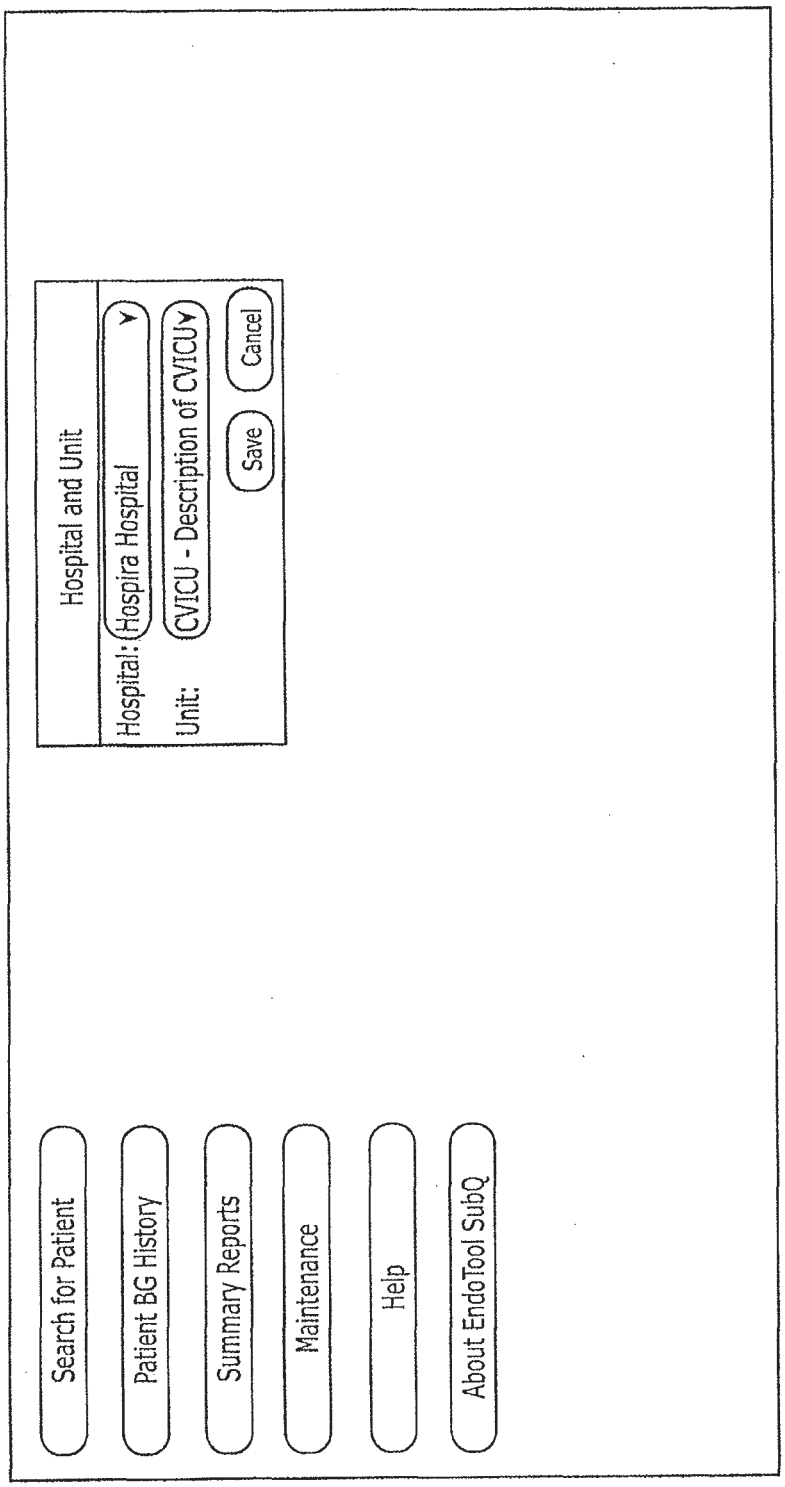

Search for Patient
Patient BG History
Summary Reports
Maintenance
Help
About EndoTool SubQ
Hospital and Unit
Hospital:
Hospira Hospital
Unit:
CVICU - Description of CVICU
Save
Cancel

FIG. 9B

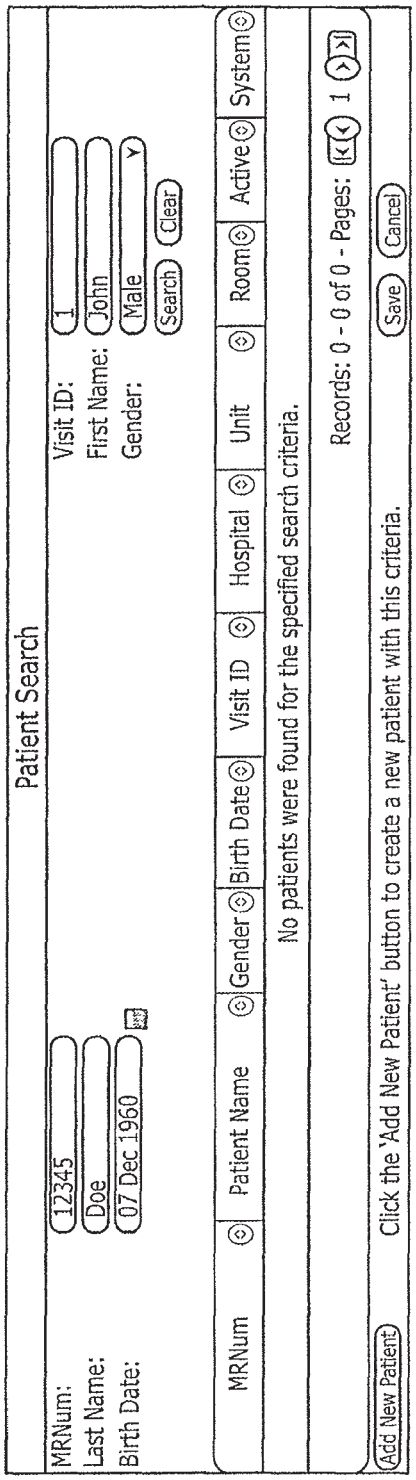

Patient Search
MRNum:
12345
Last Name:
Doe
Birth Date:
07 Dec 1960
Visit ID:
1
First Name:
John
Gender:
Male
Search
Clear
MRNum
Patient Name
Gender
Birth Date
Visit ID
Hospital
Unit
Room
Active
System
No patients were found for the specified search criteria.
Records: 0 - 0 of 0 - Pages: 1
Add New Patient
Click the 'Add New Patient' button to create a new patient with this criteria.
Save
Cancel

FIG. 9C

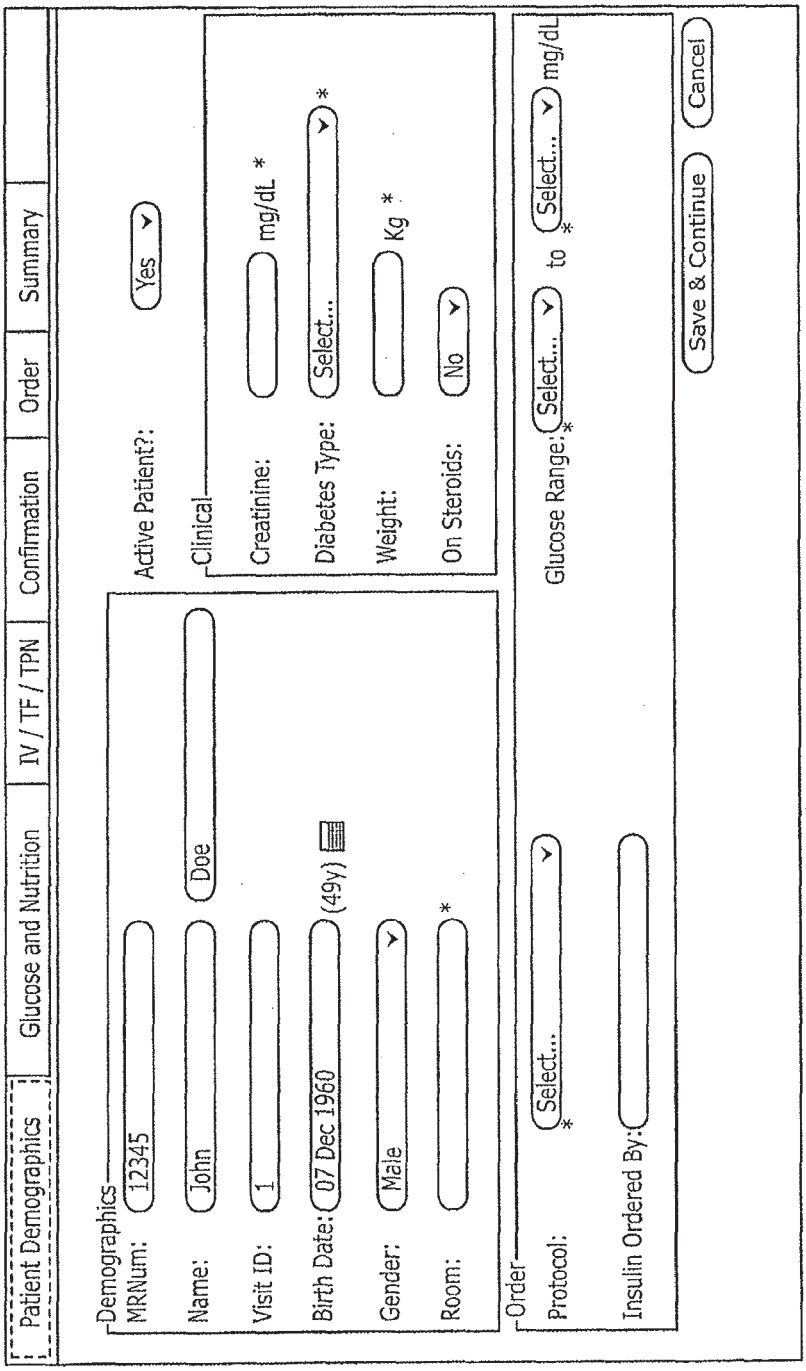

Patient Demographics
Glucose and Nutrition
IV / TF / TPN
Confirmation
Order
Summary
Demographics
MRNum: 12345
Name: John Doe
Visit ID: 1
Birth Date: 07 Dec 1960 (49y)
Gender: Male
Room: *
Active Patient?: Yes
Clinical
Creatinine: mg/dL *
Diabetes Type: Select... *
Weight: Kg *
On Steroids: No
Order
Protocol: Select... *
Glucose Range: Select... to Select... mg/dL *
Insulin Ordered By:
Save & Continue
Cancel

FIG. 9D

13/20

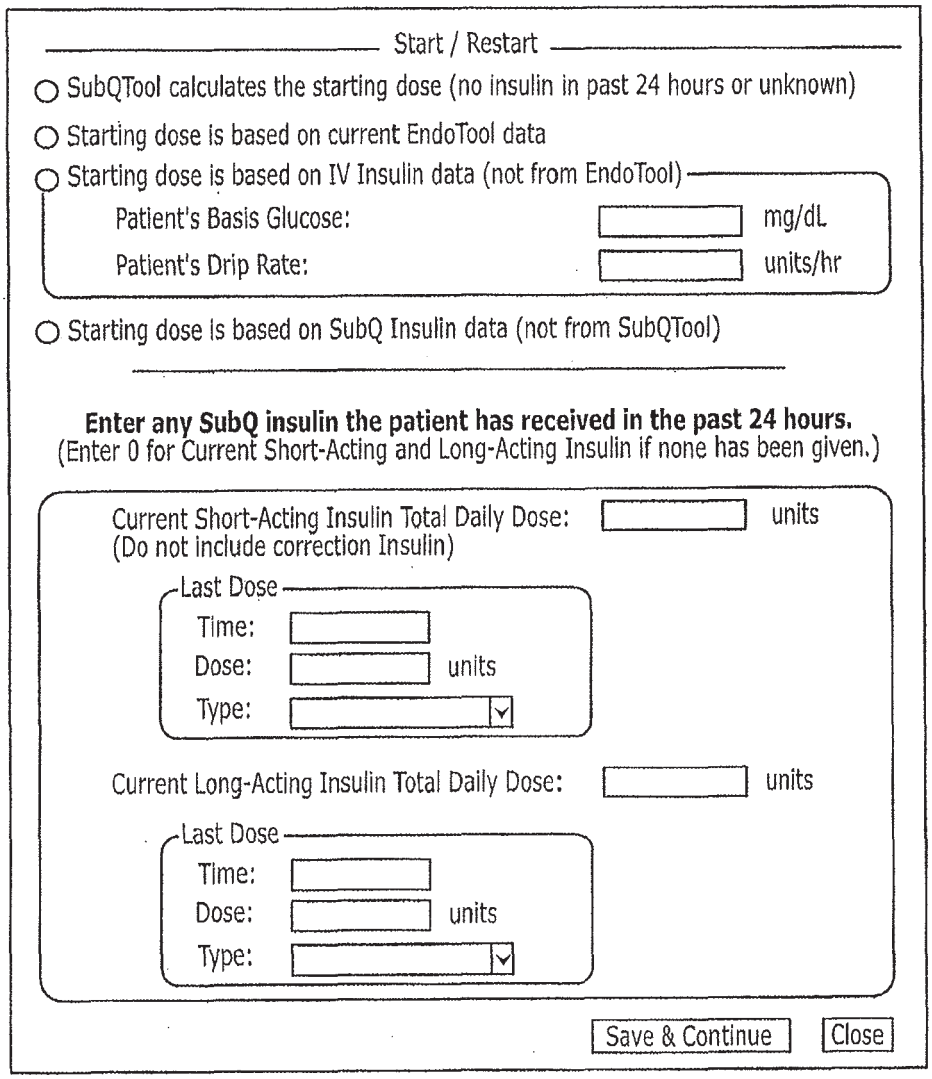

Start / Restart
SubQTool calculates the starting dose (no insulin in past 24 hours or unknown)
Starting dose is based on current EndoTool data
Starting dose is based on IV Insulin data (not from EndoTool)
Patient's Basis Glucose:
mg/dL
Patient's Drip Rate:
units/hr
Starting dose is based on SubQ Insulin data (not from SubQTool)
Enter any SubQ insulin the patient has received in the past 24 hours.
(Enter 0 for Current Short-Acting and Long-Acting Insulin if none has been given.)
Current Short-Acting Insulin Total Daily Dose:
units
(Do not include correction Insulin)
Last Dose
Time:
Dose:
units
Type:
Current Long-Acting Insulin Total Daily Dose:
units
Last Dose
Time:
Dose:
units
Type:
Save & Continue
Close

FIG. 9E

14/20

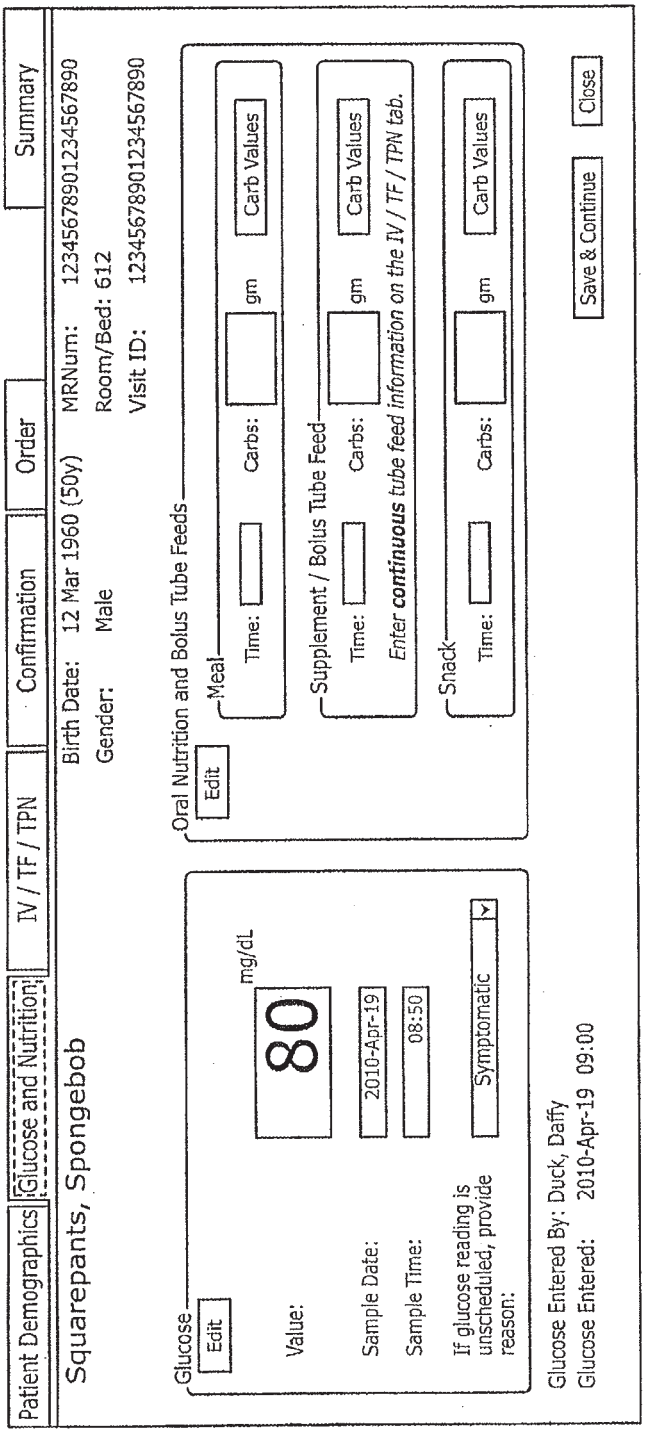

Patient Demographics
Glucose and Nutrition
IV / TF / TPN
Confirmation
Order
Summary
Squarepants, Spongebob
Birth Date: 12 Mar 1960 (50y)
Gender: Male
MRNum: 1234567890123456789O
Room/Bed: 612
Visit ID: 1234567890123456789O
Glucose
Edit
Value:
80
mg/dL
Sample Date:
2010-Apr-19
Sample Time:
08:50
If glucose reading is unscheduled, provide reason:
Symptomatic
Glucose Entered By: Duck, Daffy
Glucose Entered: 2010-Apr-19 09:00
Oral Nutrition and Bolus Tube Feeds
Edit
Meal
Time:
Carbs:
gm
Carb Values
Supplement / Bolus Tube Feed
Time:
Carbs:
gm
Carb Values
Enter continuous tube feed information on the IV / TF / TPN tab.
Snack
Time:
Carbs:
gm
Carb Values
Save & Continue
Close

FIG. 9F

15/20

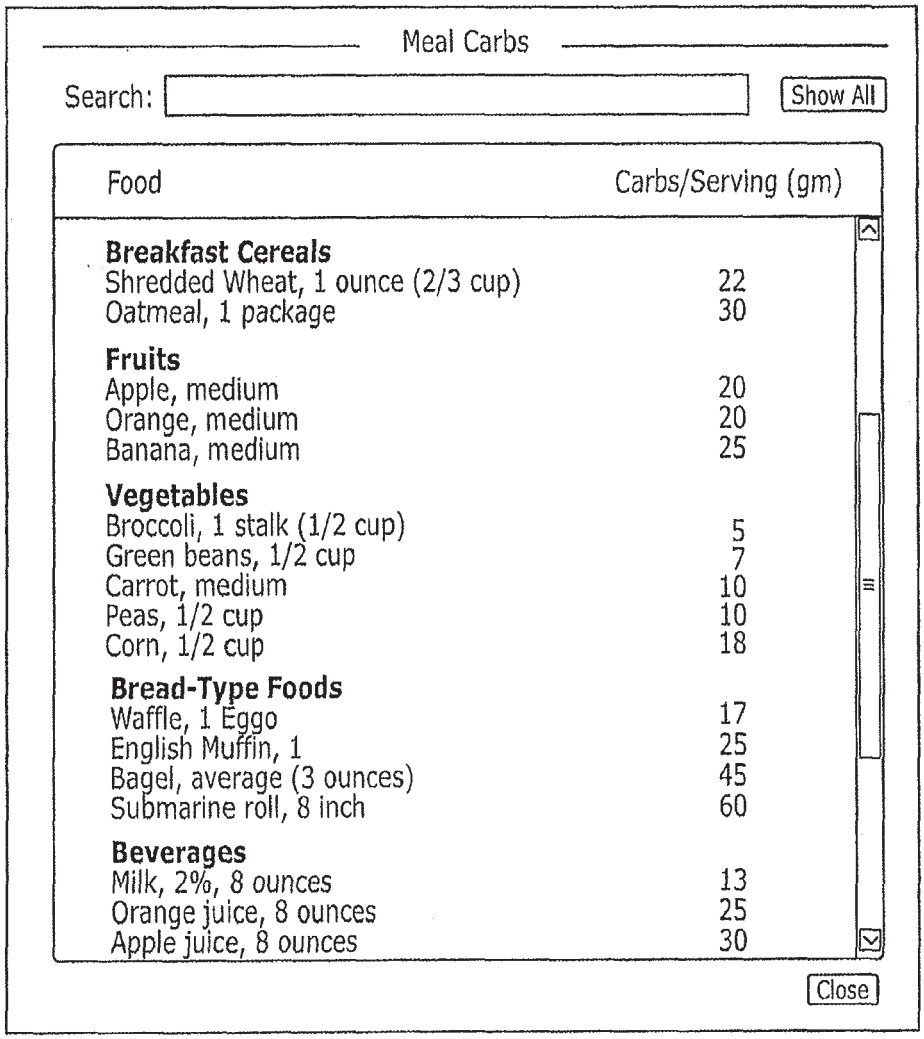

Meal Carbs
Search:
Show All
Food
Carbs/Serving (gm)
Breakfast Cereals
Shredded Wheat, 1 ounce (2/3 cup) 22
Oatmeal, 1 package 30
Fruits
Apple, medium 20
Orange, medium 20
Banana, medium 25
Vegetables
Broccoli, 1 stalk (1/2 cup) 5
Green beans, 1/2 cup 7
Carrot, medium 10
Peas, 1/2 cup 10
Corn, 1/2 cup 18
Bread-Type Foods
Waffle, 1 Eggo 17
English Muffin, 1 25
Bagel, average (3 ounces) 45
Submarine roll, 8 inch 60
Beverages
Milk, 2%, 8 ounces 13
Orange juice, 8 ounces 25
Apple juice, 8 ounces 30
Close

FIG. 9G

16/20

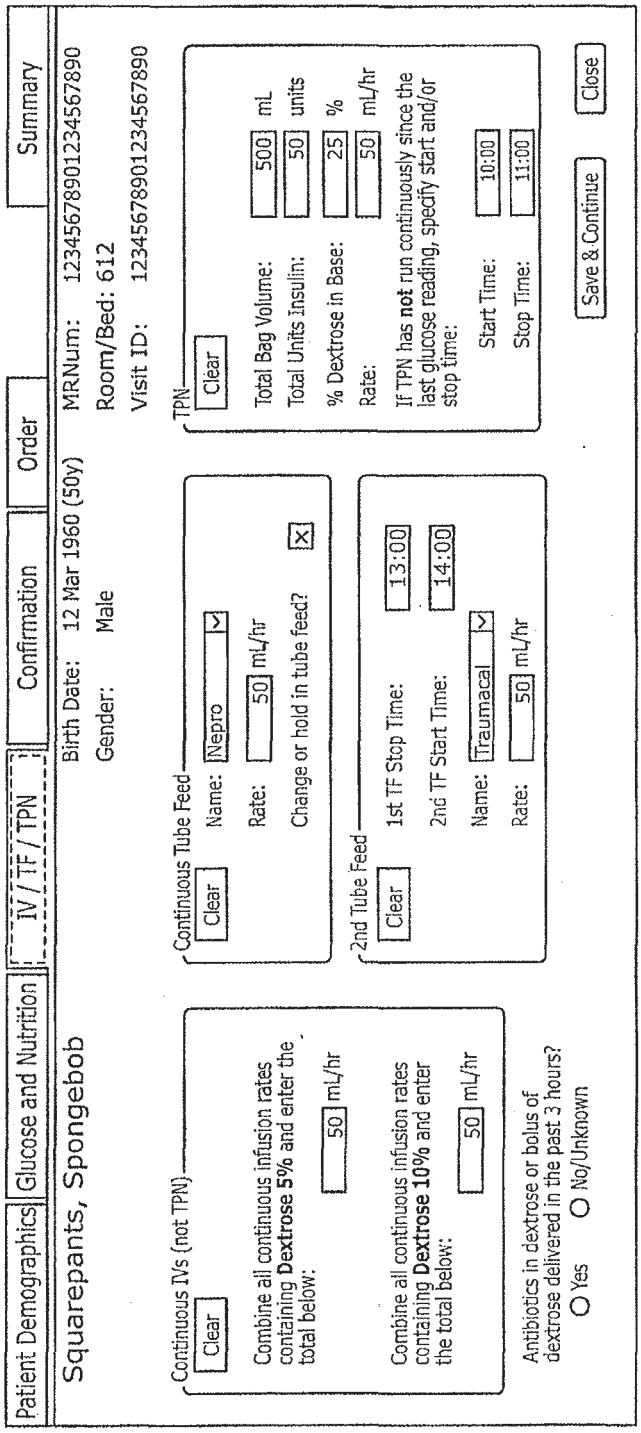

Patient Demographics
Glucose and Nutrition
IV / TF / TPN
Confirmation
Order
Summary
Squarepants, Spongebob
Birth Date: 12 Mar 1960 (50y)
Gender: Male
MRNum: 1234567890123456789O
Room/Bed: 612
Visit ID: 1234567890123456789O
Continuous IVs (not TPN)
Clear
Combine all continuous infusion rates containing Dextrose 5% and enter the total below:
50 mL/hr
Combine all continuous infusion rates containing Dextrose 10% and enter the total below:
50 mL/hr
Antibiotics in dextrose or bolus of dextrose delivered in the past 3 hours?
O Yes O No/Unknown
Continuous Tube Feed
Clear
Name: Nepro
Rate: 50 mL/hr
Change or hold in tube feed? X
2nd Tube Feed
Clear
1st TF Stop Time: 13:00
2nd TF Start Time: 14:00
Name: Traumacal
Rate: 50 mL/hr
TPN
Clear
Total Bag Volume: 500 mL
Total Units Insulin: 50 units
% Dextrose in Base: 25 %
Rate: 50 mL/hr
If TPN has not run continuously since the last glucose reading, specify start and/or stop time:
Start Time: 10:00
Stop Time: 11:00
Save & Continue
Close

FIG. 9H

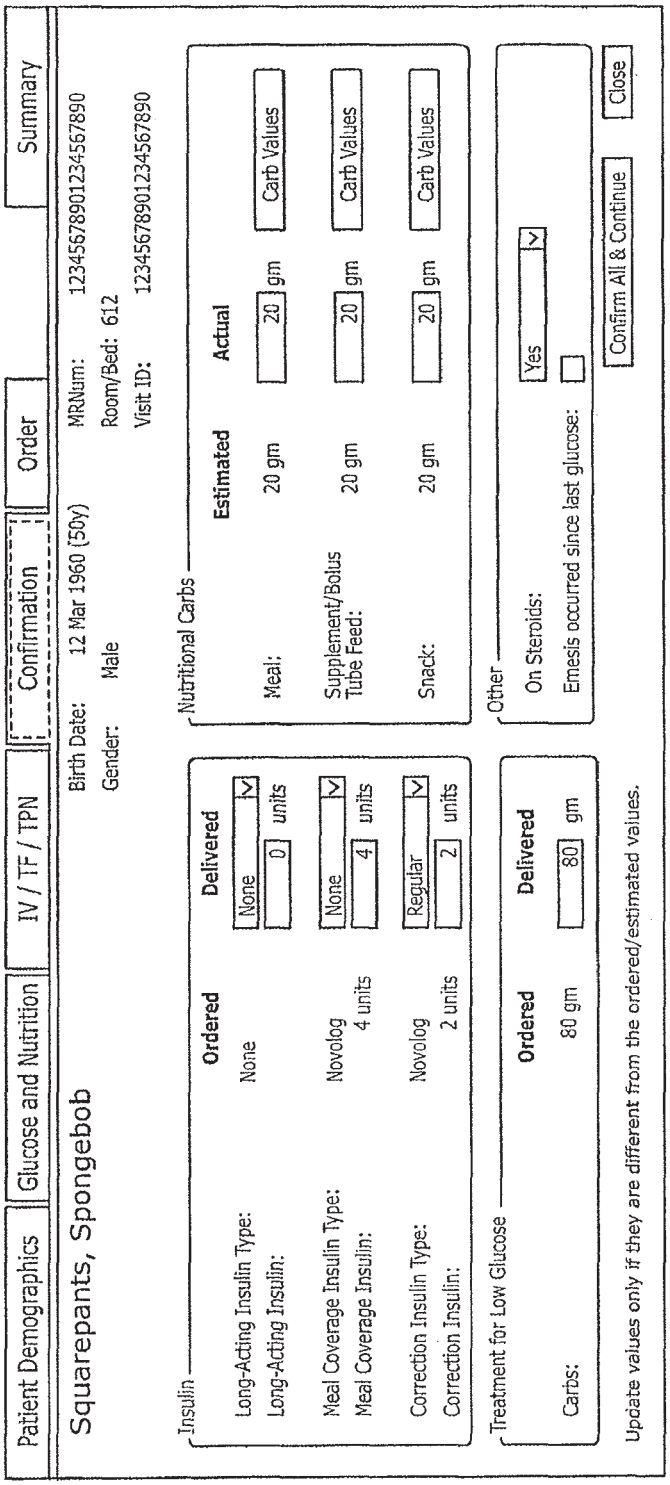

Patient Demographics
Glucose and Nutrition
IV / TF / TPN
Confirmation
Order
Summary
Squarepants, Spongebob
Birth Date: 12 Mar 1960 (50y)
Gender: Male
MRNum: 1234567890123456789O
Room/Bed: 612
Visit ID: 1234567890123456789O
Insulin
Ordered
Delivered
Long-Acting Insulin Type:
None
None
Long-Acting Insulin:
0 units
Meal Coverage Insulin Type:
Novolog
None
Meal Coverage Insulin:
4 units
4 units
Correction Insulin Type:
Novolog
Regular
Correction Insulin:
2 units
2 units
Nutritional Carbs
Estimated
Actual
Meal:
20 gm
20 gm
Carb Values
Supplement/Bolus Tube Feed:
20 gm
20 gm
Carb Values
Snack:
20 gm
20 gm
Carb Values
Treatment for Low Glucose
Ordered
Delivered
Carbs:
80 gm
80 gm
Other
On Steroids:
Yes
Emesis occurred since last glucose:
Confirm All & Continue
Close
Update values only if they are different from the ordered/estimated values.

FIG. 9I

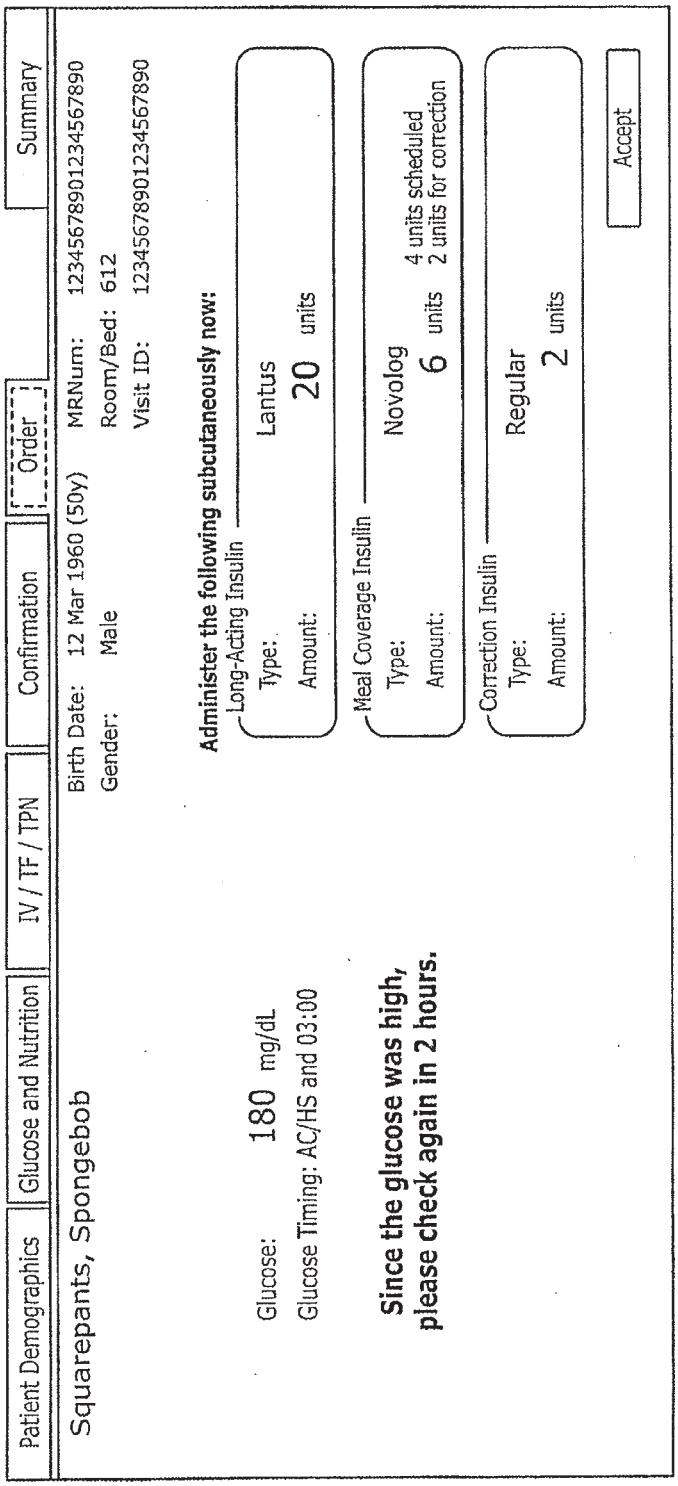

Patient Demographics
Glucose and Nutrition
IV / TF / TPN
Confirmation
Order
Summary
Squarepants, Spongebob
Birth Date: 12 Mar 1960 (50y)
Gender: Male
MRNum: 1234567890123456789O
Room/Bed: 612
Visit ID: 1234567890123456789O
Glucose: 180 mg/dL
Glucose Timing: AC/HS and 03:00
Since the glucose was high, please check again in 2 hours.
Administer the following subcutaneously now:
Long-Acting Insulin
Type: Lantus
Amount: 20 units
Meal Coverage Insulin
Type: Novolog
Amount: 6 units
4 units scheduled
2 units for correction
Correction Insulin
Type: Regular
Amount: 2 units
Accept

FIG. 9J

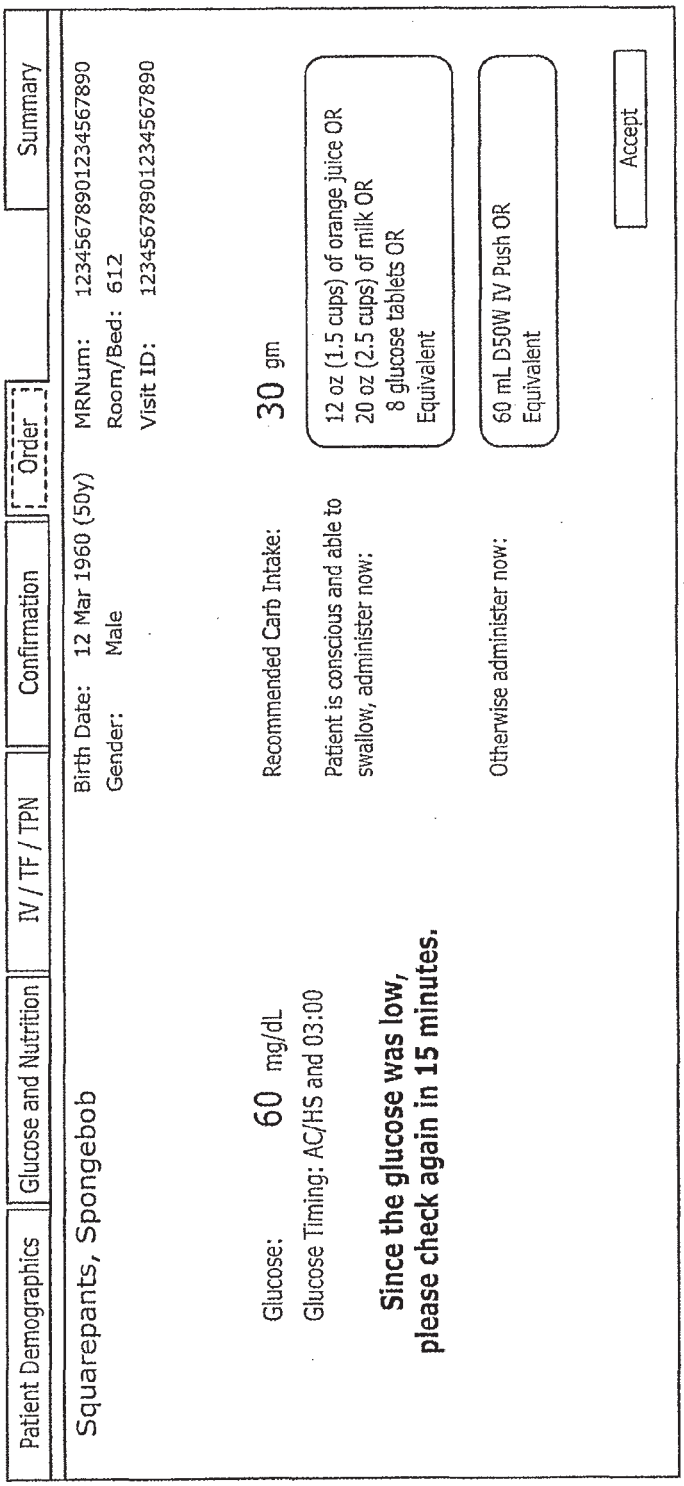

Patient Demographics
Glucose and Nutrition
IV / TF / TPN
Confirmation
Order
Summary
Squarepants, Spongebob
Birth Date: 12 Mar 1960 (50y)
Gender: Male
MRNum: 1234567890123456789O
Room/Bed: 612
Visit ID: 1234567890123456789O
Glucose: 60 mg/dL
Glucose Timing: AC/HS and 03:00
Since the glucose was low, please check again in 15 minutes.
Recommended Carb Intake: 30 gm
Patient is conscious and able to swallow, administer now:
12 oz (1.5 cups) of orange juice OR
20 oz (2.5 cups) of milk OR
8 glucose tablets OR
Equivalent
Otherwise administer now:
60 mL D50W IV Push OR
Equivalent
Accept

FIG. 9K

Patient Demographics | Glucose and Nutrition | IV / TF / TPN | Confirmation | Order | Summary

Squarepants, Spongebob

Birth Date: 12 Mar 1960 (50y) MRNum: 12345678901234567890
Gender: Male Room/Bed: 612
Visit ID: 12345678901234567890

		Orders											Intake					
Event Date/Time	Glucose (mg/dL)	Long-Acting Insulin (units)			Meal Coverage Insulin (units)			Correction Insulin (units)			Carbs (gm)		Carbs (gm)		Steroids	Unit	Completed By
		Type Delivered	Ordered	Del.	Type Delivered	Ordered	Del.	Type Delivered	Ordered	Del.	Ordered	Del.	Est.	Actual			
04/17/20 TOTAL:			**0**	**0**		**0**	**0**		**0**	**0**	**40**	**30**	**130**	**80**			
ACTIVE	120															ICU	
REVISED	100															ICU	Duck, Daffy
04/17/10 12:00	115		0	0		0	0		0	0	20	20	80	40	Yes	ICU	Frankweiler, Basil
04/176 08:00	120		0	0		0	0		0	0	20	10	50	50	Taper	ICU	Frankweiler, Basil
04/18/10 TOTAL:			**66**	**46**		**42**	**46**		**42**	**46**	**0**	**0**	**330**	**330**			
04/16/10 20:00	100	BurgessLantus	10	10	BurgessNovolo	10	10	BurgessNovolo	10	10	0	0	110	110	Off	ICU	Frankweiler, Basil
04/16/10 16:00	120	*ThomleyLantus	15	15	BurgessNovolo	10	15	BurgessNovolo	10	15	0	0	90	90	Off	ICU	Frankweiler, Basil
04/16/10 12:00	115	BurgessLantus	20	15	BurgessNovolo	15	15	BurgessNovolo	15	15	0	0	60	60	Off	ICU	Frankweiler, Basil
04/16/10 08:00	120	BurgessLantus	10	5	BurgessNovolo	7	5	BurgessNovolo	7	5	0	0	70	70	Off	ICU	Frankweiler, Basil
04/16/10 TOTAL:			**0**	**0**		**0**	**0**		**0**	**0**	**60**	**30**	**260**	**260**			
04/15/10 20:00	100		0	0		0	0		0	0	20	20	100	100	Yes	ICU	Frankweiler, Basil
04/15/10 16:00	120		0	0		0	0		0	0	20	0	80	80	Yes	ICU	Frankweiler, Basil
INCOMPLETE	115															ICU	Frankweiler, Basil
04/15/10 08:00	120		0	0		0	0		0	0	20	10	80	80	Off	ICU	Frankweiler, Basil

*- Type Delivered differs from Type Ordered

Close

FIG. 9L