

# Hemodialysis Charting



**cyberREN**

Electronic Medical Records for Nephrology

## **Charting Efficacy, Completeness & Quality Assurance**

cyberREN® offers a complete suite of hemodialysis functionality to automate and improve the hemodialysis clinical management program within a care facility.

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**cyberREN® offers a complete suite of hemodialysis functionality to automate and improve the clinical management of the hemodialysis program within a care facility.**

## Charting Efficacy

- ✓ Documenting a complete hemodialysis treatment takes approximately **5 - 6 minutes** of charting time with cyberREN.
- ✓ **Automatic electronic import** of hemodialysis machine data to a session log measurably reduces charting effort and eliminates transcription errors. Supported machines include: Fresenius 2008H/K/T (direct link) / Gambro Phoenix / Braun Dialogue / Baxter Meridian / Althin System 1000 - Tina /Cobe CentryNet / Bellco Formula.
- ✓ Hemodialysis session data automatically entered into the chart is **standardized** for all patients and dialysis machine types.
- ✓ Dialysis parameters are charted from **coded systems**, speeding up charting (point and click) and allowing later statistical analysis.
- ✓ **Auto calculation** of actual KT/V, PRU, UFR, weight change, and excess weight.
- ✓ Automatic compensation for **wheelchair** and **prostheses** weights.
- ✓ Dynamic **hemodialysis facility** and **patient scheduling** and caregiver assignment.
- ✓ Automated printing of a **Hemodialysis Worksheet**, a paper record that is used at the bedside to guide the caregiver through all required treatment activities.

## Charting Completeness

- ✓ Complete session record including **pre dialysis, intra dialysis** (session log) and **post dialysis charting**, order changes, incidents and session alerts, medications administered, heparinization, equipment preparation, nursing notes and access assessment.
- ✓ All charting required for complete reimbursement or regulatory compliance is mandatory. A **completeness check** is made at the end of treatment to ensure that everything, including the administration of all required medications, was charted properly.
- ✓ All changes to the hemodialysis order must be verified by the physician. All automatically imported data must be acknowledged by a responsible caregiver.
- ✓ All data related to hemodialysis orders, sessions, and hemodialysis access is **stored long term** for treatment monitoring, historical analysis, graphical trending, and data archiving.
- ✓ Support for charting of machine failure and replacement, dialyzer reuse.

## Quality Assurance

- ✓ Automatically alerts the caregiver to **order parameters** that have been **modified** since the last hemodialysis session.
- ✓ A system of **alerts** ensures that all prescribed activities for the session are carried out.
- ✓ Only specific personnel can close a session record, & discharge the patient from treatment, ensuring a final review of the chart and **quality control** at the end of every treatment.
- ✓ All hemodialysis treatment data may be **exported to spreadsheets** in a detailed or summary format, providing physicians a further opportunity to monitor the effectiveness of treatment. User defined, high quality graphics and tables may be generated and displayed on-screen or printed.

## Reimbursement / Financial

- ✓ All **charges** incurred during treatment are **captured** and **forwarded** to a third party billing system, eliminating all transcription activity as well as missed billings and justification errors. Treatment documentation **QA is shifted from the billing/financial staff to the clinical staff, where it belongs.**
- ✓ An individual session record cannot be closed in cyberREN until all **ordered medications** are given, or a reason is entered for not giving the medication.
- ✓ cyberREN is a hemodialysis machine **vendor neutral** solution, allowing the facility purchase flexibility in the future, and maintaining a level of competition for the clinic's business. cyberREN can communicate with several different brands of dialysis machines simultaneously, wireless dialysis machine communications is supported.
- ✓ Complete hemodialysis machine **preventative maintenance** functionality.



Electronic Medical Records for Nephrology

## Hemodialysis Session Summary

**Purpose:** To access an overview of past hemodialysis treatments.

**Workflow Integration:** Replaces the conventional paper-based hemodialysis record, serves as an index to view details pertaining to a past treatment.

**Usage:** Invoked through an icon on the Patient List, scroll back in time to find an individual treatment record

### Hemodialysis Session Summary Display

Call up selected treatment parameters as a trend over time

Summary information for all past sessions administered in the past may be shown in a tabular format

Limits the shown information to those sessions that have dialysis adequacy calculated.

Only summary information is presented

This icon calls up details pertaining to a selected treatment record

This icon creates a new hemodialysis record

Session Date	03-feb-1997	05-feb-1997	07-feb-1997	10-feb-1997	12-feb-1997
Station	Location P	Location P	Location P	Location P	Location P
Access Type					
Target Weight (kg)	82.00	81.40	82.00	82.00	82.00
Pre/Post Weight (kg)	85.0/83.7	84.3/83.7	88.2/83.8	87.6/82.6	85.5/82.2
Weight Change (kg)	2.6	0.6	4.5	3.8	2.9
Pre/Post Pulse					
BP on					
BP off					
Lowest BP	0/0	0/0	0/0	0/0	0/0
Pre/Post Temp (C)					
Initial VP (mm Hg)					
AP/VP Averaged	--/--	-30/200	--/--	--/--	--/--
Dialyzer					
Reprocessed #	17		18	13	
Duration (hr)	2.55	3.50	3.50	3.50	3.50
Blood Flow (ml/min)		398			
Dialysate Flow (ml/min)		800			
UFR (kg/hr)		0.83			
Total Heparin (units)					
Incidents	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
KT/V					
PCR					
PRU					

## Hemodialysis Session Preparation

**Purpose:** To document and the preparation of the hemodialysis treatment equipment/dialysate baths.

**Workflow Integration:** completed by technicians in advance of the patient's arrival.

**Usage:** click on those machine checks that were performed, author and time stamp are automatically set to the current user.

### Hemodialysis Charting Display

Prompts for checks to be performed in advance of dialysis treatment

Navigation during various treatment phases is accomplished using the tabs at the top of the display.

Free text comments

These values are compared with the hemodialysis order, alert generated if not consistent

The screenshot shows the 'Hemodialysis Charting' window for patient Parrissi, Gloria. The interface includes a menu bar (File, Mode, Graph, Chart, Session, Help), a status bar (Status: In progress, Station: Location 2, Start: 26-aug-2010 1706, Stop: [blank], Resuscitate: Yes, Modify), and a series of tabs (Preparation, Reuse, Day's Order, Predialysis, Intra Log 1, Intra Log 2, Medications, Events, Postdialysis). The 'Preparation' tab is active, displaying a 'Machine Checks' table and a 'Comments' text area. The 'Machine Checks' table has columns for Check, Performed, Technician, and Time. The 'Comments' area contains a text entry: 'On machine checks normal, slight grinding sound when the pump started, lasted approximately 30 seconds.' Below the table, there are input fields for electrolyte levels: K: 2.5, Ca: 2.0, Bicarb: 35.0, Conductivity: 14.1, and pH: 7.0. The bottom of the window features a toolbar with icons for file operations and a printer icon, along with an 'Assigned Patients' dropdown menu.

Check	Performed	Technician	Time
sterilant present	<input checked="" type="checkbox"/>	ross	26-aug-2010 2106
machine disinfected	<input checked="" type="checkbox"/>	ross	26-aug-2010 2106
machine rinsed	<input checked="" type="checkbox"/>	ross	26-aug-2010 2106
dialyzer rinsed	<input checked="" type="checkbox"/>	ross	26-aug-2010 2106
dialyzer primed	<input type="checkbox"/>		
sterilant negative	<input checked="" type="checkbox"/>	ross	26-aug-2010 2106
dialysate composition	<input checked="" type="checkbox"/>	ross	26-aug-2010 2106
conductivity	<input checked="" type="checkbox"/>	ross	26-aug-2010 2106
machine test	<input type="checkbox"/>		
pressure test	<input type="checkbox"/>		
alarm test	<input checked="" type="checkbox"/>	ross	26-aug-2010 2106
air detector armed	<input type="checkbox"/>		
saline clamped	<input type="checkbox"/>		
pressure limits set	<input type="checkbox"/>		
overall test	<input type="checkbox"/>		

K: 2.5      Conductivity: 14.1  
Ca: 2.0      pH: 7.0  
Bicarb: 35.0

## Hemodialysis Alerts

**Purpose:** To inform the caregiver about all activities that must be completed during the hemodialysis session. To inform the caregivers about other related items that are not classified as orders.

**Workflow Integration:** This display is called up each time that the hemodialysis session record is called up, until the display is acknowledged. This replaces handwritten notes and a tag system which may have been used with a classic paper record.

**Usage:** This display always comes up automatically at the start of treatment and shows the user all items to be completed during the treatment, in addition to the treatment itself.

### Hemodialysis Alerts Display

The diabetic status is shown from patient risk factors

Advanced directive shown

Notes can be left for the next caregiver to read in this free text field. Can't subsequently be modified for next shift

Once the Alerts have been reviewed, they should be acknowledged to indicate that the caregivers are aware of its content

A list of orders to be completed during the treatment

Patient allergies are shown here

Appointments and reminders are displayed for reference

The screenshot shows a software window titled '<Alves, Dominica -28-sep-1944-Male> Alerts'. The window has a menu bar (File, Mode, Chart, Session, Help) and a toolbar with various icons. Below the toolbar, there are fields for 'diabetes status: Diabetic' and 'resuscitate: Yes', with a 'Modify' button. A status bar indicates 'acknowledged at 04-dec-2004 2016 by cyberREN Administrator'. A text area contains the note: 'Had a knife in his pocket the last session, be careful!'. Below this is a table with columns: Allergies, Start Date, Orders, and Completed. The table contains four rows of data. At the bottom, there is an 'Order Snapshot' button and a section for 'Appointments and Reminders' with two entries.

Allergies	Start Date	Orders	Completed
	15-jul-2010	Assist the patient acquiring insurance coverage.	<input type="checkbox"/>
	03-aug-2004	Pateint HEp B Education Session	<input type="checkbox"/>
	01-aug-2004	Offer Egenerix Vaccine if Hep B antibody negative and antigen negative	<input type="checkbox"/>
	14-mar-2004	Carry out physical examination, Everything Possible	<input type="checkbox"/>

Order Snapshot

Appointments and Reminders

- Speaks Portuguese only.draw k + q tx x1 week starting 3/31/97 then weekly x2. pull wt. by b/p, wt.tbe.
- Pt. hct 26, given stool cards x3. Will bring in 1/28.

## Days Hemodialysis Order

**Purpose:** This is a copy of the long term hemodialysis order, to be used for the current treatment. Changes made here for the day are not carried forward to the next treatment.

**Workflow Integration:** The Day's Hemo Order is a copy of the active standing order that is generated with each new dialysis session. It allows the user to modify the hemo order for one session without causing long term changes.

The screenshot shows the 'Day's Order' tab in the Hemodialysis Charting software. The interface includes a menu bar (File, Mode, Graph, Chart, Session, Help), a status bar (Status: Predialysis, Station: Location 4, Start: 17-aug-2010 0918, Stop: [button], Resuscitate: Yes, Modify), and a series of tabs (Preparation, Reuse, Day's Order, Predialysis, Intra Log 1, Intra Log 2, Medications, Events, Postdialysis). The main area contains various input fields for patient data and treatment parameters. Callouts point to specific areas: 'Diagnosis for the current treatment, required for reimbursement' points to the 'Related Problem' field (585.5: CRF Stage 5 (585.5)); 'Prescription parameters that were changed for the current treatment are highlighted in green' points to green highlights on fields like 'Dialysate Temp (C)', 'K+ (mmol/L)', 'Glucose (mmol/L)', 'Dialyzer', 'Dialyzer 2', 'Tubing', 'Access Site', 'Access Type', 'Needle Gauge', 'Backup Access', 'Dialysate Flow', 'Blood Flow', 'Bicarb', 'Na+', 'Ultra Filtration Rate Profile', 'BTM Function', 'Type', and 'Profile'; 'This area contains prescription parameters that may be varied over the course of the treatment according to an algorithm' points to the 'Profiles Initial Values' section; and 'Anticoagulation information' points to the 'Anticoagulation' section.

This area contains prescription parameters that may be varied over the course of the treatment according to an algorithm

Anticoagulation information



## Predialysis Charting Display

**Purpose:** Complete all predialysis charting, patient assessments, weight registration, hemodialysis access condition, etc.

**Usage:** This information is typically filled in before the session starts. Blood pressures, pulse as well as the exact start time of the dialysis is obtained directly from the dialysis machines, automatically.

The screenshot shows the 'Hemodialysis Charting' window for patient 'Lenarz, Dawn -18-jun-1971-Female'. The interface includes a menu bar (File, Mode, Graph, Chart, Session, Help) and a status bar at the bottom. The main area is divided into several sections:

- Top Section:** Status: Predialysis, Station: Location 4, Start: 17-aug-2010 0918, Stop: [button], Resuscitate: Yes, Modify [button].
- Navigation Tabs:** Preparation, Reuse, Day's Order, Predialysis (active), Intra Log 1, Intra Log 2, Medications, Events, Postdialysis.
- Left Panel:** Outpatient [dropdown], Logging [checkbox]. Fields for Received From, Staff On, Station (Location 4, Drayton Valley Dial), Machine #, Resp Caregiver, and Treat Caregiver.
- Weights Section:** Measured Wt (kg): 117.0, Prosthesis Wt (kg): [empty], Wheelchair Wt (kg): [empty], Current Weight (kg): 117.0, Target Weight (kg): 115.0, Excess Weight (kg): 2.0, Weight Change (kg): [empty], Total Fluid Admin (kg): 0.60, Target UF Vol (kg): 2.6, Target UFR (kg/hr): 0.7, Target TMP (mm/Hg): [empty].
- Pain Section:** Acuity: 1, Type: throbbing, Location: Wrist, Measures: medication.
- Condition Section:** Condition: c/o Fatigue.
- Assessment Section:** Assessment: 26-aug-2010 2138 Ross, Angela RN. Foot check completed the following noted: Skin: Warm, Dry, intact; Heels: Skin Intact, Minimal Callous; No edema noted; Interdigital Spaces: Clean, Dry.
- Access Section:** Condition Arterial: satisfactory, Condition Venous: unsatisfactory. Checkboxes for Good Flows, Local Anesthetic, Bruit Present, Thrill Present. Cannulated X: 2.
- Heparin Section:** Pump Start At: 2139, By: ross, Hourly Units: 100.0, Bolus Units: 300, Total in Syringe (U): 6000, Verified By: long, Date: 1034.

Callout boxes provide the following explanations:

- Dialysis station noted here, important for automatic treatment data collection:** Points to the 'Station: Location 4' field.
- Dialysis technicians chart patient observations here, from a menu of standard choices:** Points to the 'Condition: c/o Fatigue' field.
- Nurses chart the patient assessment here, using a phrase catalogue for standard prompts:** Points to the 'Assessment' section.
- Anticoagulation parameters:** Points to the 'Heparin' section.
- This area is used to chart the patient's weight, as well as fluid management parameter:** Points to the 'Weights' section.
- This area is used to chart the patient's pain status:** Points to the 'Pain' section.
- This area is used to chart the patient's HD access status:** Points to the 'Access' section.



## Intra-dialysis Log

**Purpose:** To register and acknowledge all dialysis treatment parameters during actual treatment.

**Workflow integration:** nurses or dialysis technicians open this window to see of the treatment is progressing, to acknowledge incoming treatment readings, and to chart brief comments regarding the patient's status.

Initial venous and arterial pressures at a standard but flow rates are documented here, to track access deterioration

The screenshot shows the 'Hemodialysis Charting' window for patient 'Lenarz, Dawn -18-jun-1971-Female'. The status is 'Predialysis' at 'Location 4' starting on '17-aug-2010 0718'. The interface includes tabs for 'Preparation', 'Reuse', 'Day's Order', 'Predialysis', 'Intra Log 1', 'Intra Log 2', 'Medications', 'Events', and 'Postdialysis'. A 'Logging' checkbox is present. On the right, 'QI Indices' are shown with fields for 'Adequacy Date', 'KTV', 'jindal URR', and 'PCR'. A data table below shows various parameters at four time points: 0758, 0830, 0919, and 0946. A medication entry for 'CAPTOPRIL 12.5 mg' is shown at 0919. An 'Acknowledge' button is at the bottom. Callouts provide context for various elements: 'Initial VP Data - Time: 0725' points to the start time; 'Recent dialysis adequacy calculations are shown here, as an check' points to the QI indices; 'New incoming readings are shown here, ready to be acknowledged' points to the 0946 column; 'Medication administration events are also shown here in a timeline' points to the CAPTOPRIL entry; and 'This button is used to acknowledge incoming readings, which are shown in purple text until they are acknowledged' points to the Acknowledge button.

Time	0758	0830	0919	0946
Medication			CAPTOPRIL	
Med Dosage/Units			12.5 mg	
BP (mmHg)	136/98	132/76		128/67
Pulse (rate/min)	72	76		78
Blood Processed (l)	0.2	0.6		17.4
Total Fluid Removed (l)	0.08	0.12		1.20
Venous Pressure (mmHg)	182	178		186
Arterial Pressure (mmHg)	-176	-202		-212
Mean Arterial Pressure				101
Blood Flow (ml/min)	349	355		361
Dialysate Flow (ml/min)	700	700		700
Dialysate Temp. (C)	37.0	37.0		37.1
UFR (l/hr)	0.39	0.37		0.41
TMP (mmHg)	213	233		241
Cond. (mS/cm) / Sodium	14.10/141	14.20/		14.10/142
Author/Acknowledgng	cyberren/cyberren	cyberren/cyberren	ross	ross/ross
Acknowledge Time	0837	0831		2148

Recent dialysis adequacy calculations are shown here, as an check

New incoming readings are shown here, ready to be acknowledged

Medication administration events are also shown here in a timeline

This button is used to acknowledge incoming readings, which are shown in purple text until they are acknowledged

**Note:** A second page shows additional parameters including an area where subjective comments can be entered

## Medications Administered

**Purpose:** to prompt and support charting of medications to be given during treatment: only dialysis specific medications are shown.

**Usage:** Enter the time that a medication was given, choose the medication and confirm that the medication was given in a manner consistent with the order

Click in the cell next to the medications to be administered. The cell will be highlight in light blue and the order details will be displayed

The screenshot shows the 'Medications Administered' section of the software. A table lists medications with columns for time slots (0919, 2201, etc.). The 'CAPTOPRIL' row is highlighted in light blue. Below the table, order details for CAPTOPRIL are shown, including dosage (75 mcg), quantity (3), route (IV), and order details. A 'Reason not Given' field is also present. Callout boxes provide instructions: one points to the highlighted cell, another points to the 'Reason not Given' field, and a third points to the 'Order: Administer' button.

Medication \ Time	0919	2201			
CAPTOPRIL (12.5mg/tab ,TAB): CAPOTEN ,APO-CAPTO	12.5 mg				
Darbeopetin alfa (25 mcg ,syringe): Aranesp					
HEPARIN INJ.					
SALINE					

Order: **Administer**  in Formulary

Dosage: 75 mcg Quantity: 3

Route: IV IV (ml):

Blood Group /Unit Number:

Order Details: Darbeopetin alfa from formulary 75 mcg. IV at Frequency qdialysis. Intra dialysis.

Nurse 1: Ross, Angela RN

NDC #:

Admin Comments:

Reason not Given:

Some medications require two clinical staff to administer

If the medication was not administered, the reason would be documented here

Charting saline and anticoagulant administration is always available, does not require specific ordering

## Post Dialysis Charting

**Purpose:** To complete all dialysis session charting that is necessary before the patient can be discharged.

**Workflow Integration:** To chart the final patient weight, patient assessment, access condition etc.. Set the session to "discharged", when the treatment is over and the patient has left the unit. Respond to any prompts to enter missing data for chart completeness.

The stop time is automatically set when blood is no longer sensed by the machine.

The total treatment time is automatically calculated

<Lenarz, Dawn -18-jun-1971-Female> Hemodialysis Charting

File Mode Graph Chart Session Help

Status: Predialysis Station: Location 4 Start: 17-aug-2010 0718 Stop: 1235 Resuscitate: Yes Modify

Preparation Reuse Day's Order Predialysis Intra Log 1 Intra Log 2 Medications Events Postdialysis

Status:  Predialysis  In progress  Discontinued  Postdialysis  Discharged  No show  PND  Hospitalized  Transient

Outpatient  Clotted  Infiltrated  Extra Treatment Departure Time: 1315

Procedure: Hemodialysis, single treatment in a regular series Mode: walking By/With: unaccompanied

Stop Date/Time: 17-aug-2010 1235  Dialyzing Pain Acuity: 2 Measures:

Staff Off:  Rayo, Rachel RN Dialysis Time (hrs): 5.3 Type: numb

Resp Caregiver:  Confirmed Location: Wrist

Patient Sent To:  Visit Disposition:  Discharged Home

**Weights**

Measured Wt. (kg):	114.8
Prosthesis Wt. (kg):	
Wheelchair Wt. (kg):	
Post Dialysis Wt. (kg):	114.8
Target Weight (kg):	115.0
Removed Wt (kg):	2.20
Fluid Removed (kg):	1.20

**Heparin**

Heparin Left in Syringe:	123 Units
Total Heparin Infused:	6177 Units
Verified By: walter	Date: 2207

**Pt. Status**

BP Sit/Lying:	112 / 76	Pulse Sit/Lying:	78
BP Stand:	114 / 68	Pulse Stand:	78
Resps:	15	Temp (C):	37.1

**Condition:**  **Assessment:**

Discharge home, whee, Disorientated, Drowsy, c/o Fatigue

26-aug-2010 2208 Ross, Angela RN  
Treatment uneventful, no patient complaints.

**Access** Catheter only

Thrill Present  Bruit Present

Condition Arterial: satisfactory

Condition Venous: satisfactory

**Hemostasis Time**

Arterial Port (min):	4
Venous Port (min):	4
<input checked="" type="checkbox"/> Dressing Applied	

Lowest BP:  /

**Dialyzer**

Post Dialyzer Rating: Few Strands

Post dialysis blood pressures and pulses are again automatically retrieved from the dialysis machine.

The patient's pain status is again documented post dialysis

This patient assessment is combined with the predialysis assessment and is used to generate a standard progress note documenting the treatment

Post dialysis blood pressures and pulses are again automatically retrieved from the dialysis machine.