MEDICARE PART A BULLETIN

December 15, 1997 ESRD Medicare Bulletin E-31

TO: All Medicare Hospital and ESRD Providers

FROM: Provider Relations

SUBJECT: CODING FOR ADEQUACY OF HEMODIALYSIS ON CLAIMS FORM

ATTENTION MEDICARE BUSINESS OFFICE MANAGER: Please Distribute to the appropriate health care facility personnel.

Numerous research studies have demonstrated the correlation between adequacy of dialysis and health care outcomes. Increased adequacy of dialysis results in reduced hospitalizations, co-morbidities, and risk of death. One of the Health Care Financing Administration's (HCFA's) most important quality of care initiatives, is to ensure that as many ESRD beneficiaries as possible, are able to achieve acceptable levels of adequate dialysis, in accordance with recommendations set forth by the National Institutes of Health Consensus Conference and the Renal Physician Association. However, in order to effectively monitor the levels of dialysis treatment provided to Medicare patients, HCFA needs a vehicle to gather data on a patient-specific basis.

Section 4558 of the Balance Budget Act (BBA) of 1997, requires HCFA to develop and implement a method to measure and report on the quality of dialysis services. HCFA plans to develop a comprehensive data collection system, to obtain multiple ESRD quality indicators that can be used in quality improvement programs. However, the development of such a database will take some time. HCFA needs information on adequacy of dialysis in the short-term in order to begin effectively monitoring this critically important aspect of dialysis quality. Therefore, it is necessary for HCFA to develop an interim means to gather information on the adequacy of dialysis treatments.

Effective for services furnished on or after January 1, 1998, it will be necessary for ESRD facilities utilizing the HCFA-1450 (UB-92) claims format to report HCPCS code and modifier information in form locator 44 of the HCFA-1450 (UB-92) claim format for all hemodialysis patients. Consequently, effective January 1, 1998, HCFA will collect the adequacy of hemodialysis as measured by Urea Reduction Ratio (URR) via the modifier information on the claims form (Modifiers are not required for peritoneal dialysis patients at this time. HCFA expects to develop appropriate modifiers for peritoneal dialysis patients in the near future.). The modifier must be attached to a HCPCS code. Report the CPT code and modifier on the line item for the dialysis services (revenue code 820, 821, and 829).

ESRD facilities must report CPT code 90999 and one of the G modifiers listed below as appropriate on all claims filed for services furnished for hemodialysis on or after January 1, 1998.

G1 Most recent URR of less than 60%
G2 Most recent URR of 60% to 64.9%
G3 Most recent URR of 65% to 69.9%
G4 Most recent URR of 70% to 74.9%
G5 Most recent URR 75% or greater

ESRD facilities must monitor hemodialysis adequacy monthly for all facility patients. Home hemodialysis patients may be monitored less frequently, but no less often than quarterly.

Since HCFA will be profiling facilities based on the URR ranges reported, it is recommended that dialysis facilities use a standardized methodology for drawing the pre and post-dialysis Blood Urea Nitrogen (BUN) samples that are used in the calculation of the URR. Facilities may use either the "Slow Flow/Stop Pump" or "Blood Reinfusion Sampling" techniques. Attached providers will find the "Recommended Sampling of URR", which has been adopted from the Dialysis Outcomes Quality Initiative's Hemodialysis Adequacy Clinical Guideline. This document describes the techniques and provides explicit details regarding the methodologies that should be utilized for sampling the URR for hemodialysis patients.

Questions regarding this bulletin may be addressed to the Medicare Part A Customer Service Department by calling (904) 355-8899.

Recommended Sampling for URR

Blood samples for BUN measurement must be drawn in a particular manner. Draw pre-dialysis BUN samples immediately prior to dialysis, using a technique that avoids dilution of the blood sample with saline or heparin. Post-dialysis BUN samples should be drawn using the Slow Flow/Stop Pump Sampling Technique that prevents sample dilution with recirculated blood and minimizes the confounding effects of urea rebound. Alternatively, the Blood Reinfusion Sampling Technique may be used. Both techniques are described below.

Pre-dialysis Blood Sampling Procedures

The pre-dialysis BUN must be drawn before dialysis is started to prevent this sample from reflecting any impact of dialysis. Dilution of the pre-dialysis sample with saline or heparin must be avoided or the pre-dialysis BUN will be artificially low, resulting in a falsely low URR.

Method When Using Arteriovenous Fistula or Graft

Obtain the blood specimen from the arterial needle prior to connecting the arterial blood tubing or flushing the needle. Be sure that no saline and/or heparin is in the arterial needle and tubing prior to drawing the sample.

Method When Using Venous Catheter

1. Withdraw any heparin and saline from the arterial port of the catheter, following the dialysis unit's protocol.

2. For adult patients, using a sterile technique, withdraw 10 mL of blood from the arterial port of the catheter. For pediatric patients, withdraw 3 to 5 mL, according to the fill volume of the catheter. Do not discard this blood if the intent is to reinfuse it after the sampling is complete. (See step 4.)

3. Connect a new syringe or collection device and draw the sample for BUN measurement.

4. Complete initiation of hemodialysis per dialysis unit protocol. (An optional step is to reinfuse the blood drawn from step 2.)

Post-dialysis Blood Sampling Procedures

Proper timing for acquisition of post dialysis BUN sample is critical. Immediately upon completion of hemodialysis, if vascular access recirculation was present, some of the blood remaining in the angioaccess and extracorporeal circuit is actually recirculated blood. That is, some of the just-dialyzed blood has been routed through the angioaccess and the extracorporeal circuit for hemodialysis without that blood first having passed through waste-product-rich tissues. If the blood sample is drawn immediately upon completion of dialysis, just-dialyzed blood that has recirculated into the angioaccess will dilute the sample. The consequence of sampling this admixture is a falsely reduced BUN value and artificially elevated URR. Therefore, the amount of dialysis delivered will be overestimated.

Early urea rebound may be viewed as a two-component process. The first component is secondary to blood recirculation within the angioaccess or catheter and is not present in patients without access recirculation. If access recirculation is present, urea rebound from recirculation begins immediately upon completion of hemodialysis and resolves in less than 1 minute, usually approximately 20 seconds. The second component of early urea rebound is cardiopulmonary recirculation that begins approximately 20 seconds after the completion of hemodialysis and is completed 2 to 3 minutes after slowing or stopping of the blood pump. Cardiopulmonary recirculation refers to the routing of just-dialyzed blood through the veins to the heart, pulmonary circuit, and back to the angioaccess without the passage of the just-dialyzed blood through any urea-rich tissues. The late phase of urea rebound is completed within 30 to 60 minutes after the cessation of dialysis. The late phase is a consequence of flow-volume disequilibrium (perfusion model) and of delayed transcellular movement of urea (diffusion model).

Because of access recirculation, the post-BUN concentration and the resultant URR will vary greatly depending upon the timing of the acquisition of the blood sample. For example, the post-dialysis BUN concentration will be higher, and the resultant URR will be relatively lower, with increased time after the completion of hemodialysis. Although the most accurate way to resolve this problem is to uniformly wait 30 minutes after the completion of hemodialysis before drawing a post-dialysis BUN sample, this approach is impractical for busy patients and dialysis facilities.

Method for Blood Sampling Using the Slow Flow/Stop Pump Sampling Technique

1. At the completion of hemodialysis, turn off the dialysate flow and decrease the ultrafiltration rate (UFR) to 50 mL/hr or the lowest transmembrane pressure (TMP)/UFR setting. If the dialysis machine does not allow for turning off the dialysate flow, or if doing so violates unit policy, decrease the dialysate flow to its minimum setting.

2. Decrease the blood flow to 50-100 mL/min for 15 seconds. To prevent pump shut-off as the blood flow rate is reduced, it may be necessary to manually adjust the venous pressure limits downward.

At this point, proceed with either the "Slow Flow" or "Stop Pump" Technique.

Slow Flow Method

3. With the blood pump still running at 50-100 mL/min, draw the blood sample for post-dialysis BUN measurement from the arterial sampling port closest to the patient.

4. Stop the blood pump and complete the patient disconnection procedure as per dialysis unit protocol.

Stop Pump Method

3. After flushing the dead space in the arterial needle tubing of any access recirculated blood by decreasing the pump speed for 15 seconds, immediately stop the blood pump.

4. Clamp the arterial and venous blood lines. Clamp the arterial needle tubing.

5. Blood for post-dialysis BUN measurement may be sampled by needle aspiration from the arterial sampling port closest to the patient. Alternatively, blood may be obtained from the arterial needle tubing after disconnection from the arterial blood line and attaching a vacutainer or syringe without a needle.

6. Blood is returned to the patient and the patient disconnection procedure proceeds as per unit protocol.

Successful application of the Slow Flow/Stop Pump Sampling Technique has several advantages. There is minimal technical variability between blood drawing sessions, so that the calculation of the delivered dose of hemodialysis is impacted less by this operation. Therefore, longitudinal comparisons of hemodialysis adequacy more accurately reflect delivered dialysis dose. Furthermore, the use of a single-pool model for formal urea kinetic modeling mandates that post-dialysis BUN be measured without the effects of access recirculation and before a significant amount of urea rebound has occurred. The relatively precise timing of the blood sampling (shortly after the cessation of hemodialysis) meets this requirement by minimizing the confounding effects of urea rebound.

There are challenges associated with the use of the Slow Flow/Stop Pump Sampling Technique, especially the relative precision required in timing the blood draws and setting the blood and dialysate pumps. There is concern that in busy hemodialysis units, where the health care team is performing multiple tasks at the completion of dialysis, the rigor needed to execute the Slow Flow/Stop Pump Sampling Technique cannot be provided routinely. In addition, the necessity that the Slow Flow/Stop Pump Sampling Technique blood samples be drawn from the arterial port or the arterial needle tubing increases the likelihood of error.

An alternative but less reproducible method of post-dialysis BUN sampling is the Blood Reinfusion Sampling Technique.

Method for Blood Sampling Using Blood Reinfusion Sampling Technique

1. Completely reinfuse the patient's blood using <500 mL saline as per the dialysis unit's protocol.

2. Clamp blood and needle lines. Keep arterial needle in place. Completely disconnect the patient from the extracorporeal circuit, as per dialysis unit protocol.

3. Attach a 10 mL syringe to the arterial needle tubing using aseptic technique.

4. Unclamp arterial needle tubing/catheter. Withdraw and reinfuse 5 to 7 mL of blood several times.

5. Clamp arterial needle tubing/catheter after the line is filled with blood.

6. Utilizing sterile technique, detach the syringe and set it aside.

7. Attach a multiple-sample luer adapter or a second syringe to vacutainer needle holder. Attach whichever of these devices is used to the end of the arterial needle tubing or catheter. Push the tube onto the holder.

8. Open clamp on arterial needle tubing/catheter line to collect the post-dialysis BUN sample. Clamp line when tube is full. Remove adapter and needle holder or syringe.

9. Clamp the blood line, and complete termination procedure as per dialysis unit protocol.

The principal advantage of the Blood Reinfusion Sampling Technique for obtaining the post-dialysis BUN sample is its relative simplicity, which reduces the likelihood of operational error. Unlike the Slow Flow/Stop Pump Sampling Technique, it is not necessary in the Blood Reinfusion Sampling Technique for the post-dialysis BUN sample to be drawn with the blood pump, dialysate pump, and ultrafiltration controller or TMP/UFR rate at precise settings. Similarly, critical timing and location of the blood draw, the cornerstones of the Slow Flow/Stop Pump Sampling Technique, are not required for the Blood Reinfusion Sampling Technique. For example, because the extracorporeal circuit no longer exists after blood reinfusion, the post-dialysis blood sample does not have to be drawn from the arterial sampling port or arterial needle tubing.

It takes at least 5 minutes to return a patient's blood at the end of hemodialysis. Therefore, the Blood Reinfusion Sampling Technique allows for the post-dialysis BUN sample to be obtained after

resolution of cardiopulmonary recirculation (which takes 2 to 3 minutes). By this time, some urea rebound has occurred secondary to compartment equilibration. In effect, the post-dialysis BUN sample is a partially equilibrated determination and has a higher BUN level resulting in a lower URR.

Facilities using the Blood Reinfusion Sampling Technique to obtain their post-dialysis BUN samples will have URR values that are systematically lower than dialysis units using the Slow Flow/Stop Pump Sampling Technique, even when the amount of delivered dialysis is the same.

Hemodialysis facilities should adopt a single BUN sampling method. If several different methods are used, the sampling method should be routinely recorded. The sampling method used for a given patient should remain consistent. The pre- and post-dialysis BUN samples used to measure the adequacy of a patient's dialysis treatment must be drawn on the same day and should be processed in the same batch analysis at the laboratory.