ReNews

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The Impact of Anticoagulation Techniques on Dialyzer Reuse

By Jerome J. Beck*

Introduction

For most dialysis programs, the primary reason for discarding reused dialyzers is volume-related, e.g. low volume, excessive header clotting, excessive fiber clotting. Improving a facility's dialyzer reuse management will reduce the incidence of these failures and, as a result, increase reuse success and improve the facility's cost savings efforts. However, the impact of volume-related failures goes well beyond cost. These failures impact our patients directly and possibly profoundly.

Dialyzers fail for volume or header and fiber clotting because blood remains in the dialyzer after terminating treatment. In other words, the patient loses blood. Further, when volume is diminished, clearances are diminished potentially to a point where dialysis adequacy becomes unacceptable. These outcomes are not just dialyzer reuse issues, they are basic patient management issues, whether a facility reuses or not. Managing how we deliver our total care, and including dialyzer reuse in this process, improves our patient outcomes and reuse success as well.

When we at RENALWEST L.C. began to fully understand this, our reuse program experienced a remarkable turnaround. Our ten outpatient hemodialysis facilities had a reuse success of approximately 12 average uses per dialyzer at the beginning of 1992. Today, with 15 facilities, our average has improved to 27.6 uses. Along with the improved numbers, we see a more informed staff, excellent communication between reuse and nursing personnel, and an understanding of how all actions impact our delivery of care.

Studies

At the beginning of 1992, we were very concerned about the unacceptable reuse trend within our com-

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About the Author

Jerome Beck is the Operations Manager for RenalWest L.C. Mr. Beck has worked for more than 18 years in several dialysis-related capacities including biomedical and clinical technology, staff development coordinator, technical director and facility administration. Additionally, he has assisted both the Centers for Disease Control and Arizona State University in various hemodialysis-related studies and evaluations. Mr. Beck has a B.S. degree in Business Administration. He has published in dialysis journals and lectured nationally on hemodialysis technology issues. He has served on the AAMI Renal Disease and Detoxification Committee, Board of Nephrology Examiners, Nursing and Technology and as Western Vice President of NANT. In 1994, Mr. Beck received NANT's Torchbearer Award.

** The procedures for reuse detailed herein reflect the considerations and views of the author and RenalWest L.C.and should not necessarily be attributed to Renal Systems or Minntech Corporation.*

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pany. One of our facilities had a reputation of particularly outstanding care, but it was achieving an average reuse success of only nine. We assessed the facility's practices and equipment including heparin technique, ACT test procedure, reuse procedures, heparin pump operation and calibration, ACT equipment operation and calibration, and reuse equipment. As a result, we identified three areas of concern.

First, our heparin protocols were incomplete. Typically, new patients to the facility came through the hospital-based acute program. Heparinization goals were to prevent dialyzers from completely clotting. Therefore, a routine order was 1000 units systemic heparin at initiation and 1000 units an hour until one hour prior to termination of treatment. As patients came to the outpatient facility, no adjustments were made unless significant clotting of the dialyzer or bloodlines occurred.

Second, we were incorrectly performing our ACT test. For convenience, we would draw 0.5ml of blood for our ACT instead of the recommended 0.4ml. Additionally, we did not pay attention to the time between blood collection and testing. Both errors caused our results to be invalid. Compounding this problem, we did nothing with results unless they were extremely high or low.

Finally, we found the gauge used to measure the pressure of the water supplied to the reuse area to be inaccurate. The actual pressure was considerably lower than the value registered on the gauge. This could have reduced the quality of cleaning in our manual system.

The gauge was easily repaired, but we wanted to proceed cautiously with our other concerns. The impact of under-heparinization was already evident. We did not want to swing the pendulum to the other side and harm our patients through over-heparinization. As a result, we implemented a heparin/reuse study with the goal of providing the minimum heparin necessary to achieve minimal blood loss, allow the delivery of the dialysis prescription, and cause no adverse patient outcome.

Our first step was to review the current literature on heparin. Heparin therapy has been controversial for a very long time. There are three reasons for this: the drug itself, systems used to monitor the patient, and the individual patient. This results in a very unpredictable picture for the clinician. Heparin activity can change from lot to lot. Patients respond differently and sometimes unexpectedly. Lab test results can vary due to collection techniques, variances in reagents, and sample processing. [1]

Further, heparin can bring upon several complications. These are almost entirely bleeding related including prolonged vascular site bleeding and/or hematoma, ecchymosis, nose bleeds, and worsening of existing bleeding tendencies. Additionally, osteoporosis has been observed (Table I) [2,3]. Therefore, patients should be identified by their risk factors and heparin strategies developed as appropriate to minimize complications.

Table I

Complications of Heparin Therapy

- Prolonged vascular site bleeding and/or hemotoma
- Ecchymosis
- Nose bleeds
- Worsening of G.I., retinal, subdural hematoma, retroperitoneal and menstrual bleeding
- Pericardial and pleural effusions
- Hematuria
- Osteoporosis

Two risk groups can be identified as seen in Table II.[4,5,6]

Table II

Patient Risk Classification

- Moderate Risk
  - Recent Surgery
  - G.I. or other bleed history
  - Prolonged bleeding from needle sites
- High Risk
  - Pericarditis
  - Any active bleeding
  - Recent surgery with bleeding complications
  - Recent surgery after which bleeding would be dangerous
  - Thrombocytopenia
  - Coagulopathy

From this, various anticoagulation techniques can be used. Stable patients with no known bleeding risk can be dialyzed using one of two routine systemic heparinization methods. The first consists of a loading bolus and then continuous intradialytic infusion. The second consists of a loading bolus with optional intermittent intradialytic boluses (Table III).

Table III

Routine Systemic Heparinization

- Stable patients with no known bleeding risk
- Intradialytic clot time 1.5 to 2.0 times the baseline clot time
- Takeoff clot time 1.4 times the baseline clot time
- Two methods:
  - Predialysis loading bolus and continuous intradialytic infusion
  - Predialysis loading bolus and optional intermittent intradialytic boluses

When heparinizing patients with one or more bleeding risks, tight systemic heparinization using continuous infusion is often employed. In this case, patient clotting times are maintained much lower than in routine heparinization (Table IV).

Moderate risk patients tend to be maintained at a clot time 1.4 times the baseline while high risk patients

are maintained at the low end at 1.25 times the baseline.

Table IV

Tight Systemic Heparinization

- Patients who possess one or more bleeding risks
- Intradialytic clot time 1.25 to 1.40 times the baseline clot time
- Takeoff clot time 1.25 to 1.40 times the baseline clot time
- Tight systemic heparinization using a loading bolus and continuous intradialytic heparinization is most common

After identifying the heparinization method, three groups of factors should be evaluated when determining heparin dosage. These are individual patient factors, treatment factors, and medications as seen in Tables V and VI.

Table V

Factors Affecting Heparinization—Increased Heparin

Patient Factors
- Hct, fever, thrombosis, infection, diabetic nephropathy, M.I., cancer, acute and chronic liver disease

Treatment Factors
- BFR, TMT time, dialyzer, presence of clotting, intradialytic blood or lipid infusion

Medications
- Digitalis, tetracycline, nicotine, antihistamines

Table VI

Factors Affecting Heparinization—Decreased Heparin

Patient Factors
- Hct, active bleeding, recent surgery

Treatment Factors
- BFR, TMT time, dialyzer, frequent saline rinses

Medications
- Aspirin, ibuprofen, coumadin, persantine, dextran, phenylbutazone, indomethacin, hydroxychloroquine

If the clinician does not take these into consideration, anticoagulation problems will arise or unnecessary dosage adjustments will be made.[7,8] During dialysis, the effectiveness of heparin therapy can be evaluated using clot times, visual inspection of the extracorporeal circuit using saline flushes, extracorporeal circuit pressures, visual inspection post dialysis, and changes in dialyzer TCV.

The literature review gave us few surprises. This information was not new. Instead, we realized we had simply stopped doing what we knew we should be doing. With this in mind, we set about the task of re-evaluating our protocols and revising as necessary. **Table VII** illustrates these changes. Additionally, we felt that intensive staff inservicing was necessary not only to educate but also to get their "buy in" to the many changes and the benefits we could achieve.

Table VII

Revised Protocol

- Provide loading bolus only
- Mid run ACT 2.0 times baseline (range 240-300 sec.)
- Takeoff ACT 1.4 times baseline
- Loading bolus given 3-5 min. predialysis
- Bolus determined by body weight - 100 u/kg
- Monitor ACT on all patients
  - New or unstable: baseline and hourly
  - Stabilized: midrun only
- Visually monitor extracorporeal circuit
- Reuse staff notify nursing of dialyzer appearance or 5 ml or greater TCV loss

We felt that a loading bolus only would provide the best approach for this facility. The average treatment time was slightly less than three hours. We could safely administer an amount of heparin pre-dialysis that would safely anticoagulate the patient for the relatively short treatment time. Additionally, we would save the supply expense and staff time of performing an additional continuous infusion. This change, in itself, would be an easy adjustment for staff from the previous method; however, the bolus must be given three to five minutes prior to dialysis initiation to ensure maximum heparin activity. We needed the staff's input in order for this as well as the other adjustments to be a success. Other adjustments included calculation of heparin dosage by nursing staff, ACT test methods, initiation of reuse within ten minutes of dialysis termination , and assessment of extracorporeal clotting. Also key to this process was the need for timely, complete communication among staff.

Immediately, we experienced an improvement in reuse success with a corresponding decline in volume-related failures. The reuse average increased from approximately 9.5 to 30 uses within 8 months.

Our average heparinization went from 1000 units pre-dialysis and 1000 units an hour until the last hour of treatment to a loading bolus of 5000 units only. Additionally, staff consistently administered the bolus three to five minutes pre-dialysis. We found staff more actively managing anticoagulation with their patients as a result of increased awareness of the entire process.

No adverse outcomes were noted. The average time to clot the venipuncture sites post-dialysis remained between 10-15 minutes. When patients complained of prolonged bleeding, staff found most problems were related to how the patient was holding the sites. Further, prior to beginning the study, one diabetic patient had complained of retinal bleeds. He was maintained on very tight heparin, and as a result, he had a very poor reuse average. At the time the study was beginning, he was referred for laser eye surgery. After surgery he received routine heparin doses with-

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Table VIII

Continuous Infusion
- All patients on continuous systemic heparinization
- Mid run ACT 2.0 times baseline (range 240-300 sec.)
- Takeoff ACT 1.4 times baseline
- Load bolus given 3-5 min predialysis
- Infusion stopped last hour of run
- New patients are started on tight protocol:
  - 1000u pre/1000u hourly
  - Baseline, hourly and takeoff ACT
  - Increase load bolus 500 u (1000 u if excess clotting occurs)
  - Increase risk patients as tolerated, i.e. signs and symptoms
- Stable patients have mid run ACT only
- Adjust load bolus
  - First hour or mid ACT on new patients is low
  - Mid ACT on stable patients is low
  - Visual inspection indicates early clot formation in dialyzer or blood lines
- Adjust infusion
  - Takeoff ACT is too low and visual inspection indicates clot formation in the dialyzer or blood lines
  - Typically reduce risk patients to 500u and perform NaCl flushes
  - Typically increase large patients to 1500u to maintain ACT
  - Needle sites take too long to clot
- Reuse staff notify nursing of any low TCV, large TCV drops or poor appearance

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out any further complaints. His reuse average increased significantly, as well.

Finally, we asked the staff what they felt most contributed to the improvement in reuse success. Two reasons were consistently offered: 1) we understand the process better and how the various steps are related and 2) communication between nursing and technical personnel has improved.

As a company, we began implementing these new protocols in the other facilities. During this period, we converted from a manual reuse system to an automated system using Renal Systems' Renatron® II Automated Dialyzer Reprocessing System with Renalog® software. Some facilities were adapting well while others were struggling with a high incidence of volume-related failures.

One of these facilities felt that the loading bolus only heparinization approach was inappropriate for their patient population. The average treatment time was almost one-half hour longer. The facility had a larger portion of patients with a primary diagnosis of diabetes and the staff was concerned about exacerbating any bleeding tendencies in this group. Instead, they implemented a routine heparinization protocol which included a smaller loading dose plus continuous infusion until the last hour of treatment. Table VIII details their approach.

The unique features of this methodology are: 1) conservative management of new patients and 2) rationale for adjusting loading bolus versus infusion. This approach proved equally successful as the first method. The reuse average increased from 9 to more than 30 uses.

Converting to the continuous infusion method changed the average heparin profile as illustrated in Table IX.

Table IX

Comparison of Techniques

Technique	Pre bolus	Continuous
Load Bolus	5250u	4100u
Infusion	--	900 u/hr
Total/TMT	5250u	6200u

The loading bolus was reduced but total heparin administered increased.

Throughout this process, one problem continued to surface -- How do we best manage patients with subclavian accesses? This group of patients within our company had very frequent blood flow problems. As a result, blood flow rates were often much lower than prescribed and additional clotting occurred. One of our facilities had an extremely large percentage of its total population comprised of this group, 55%- 85%. This high concentration lended itself to a focused evaluation of optimal heparinization protocols.

The facility found that continuous systemic infusion throughout the entire treatment worked best. Again, as in all other cases, the loading bolus was given 3-5 minutes pre-dialysis. The bolus amount was determined by patient body weight. The infusion rate was set at 1000 units an hour except for large patients and clotters which received 1500 units or risk patients which received 500 units (Table X).

Again, we achieved excellent results, with an increase from 9 to 30 uses.

No adverse patient outcomes were associated with this protocol during the study.

During this period, we continued to monitor dialysis adequacy using urea kinetic modeling. In no case was dialysis adequacy reduced in any of the study facilities. In evaluating this, we looked at patient treatment orders including the dialyzer model, treatment length, and blood flow rates.

Conclusions

As a company, our reuse success continues to improve. We have found both a loading bolus only, as well as a loading bolus followed with continuous infusion, are equally successful approaches to

anticoagulation therapy. In some cases, the method used is based on facility preference or comfort level. However, regardless of preference, staff follow formalized and thoughtfully developed protocols which provide minimal clotting while protecting our patients from any potential complication.

This success has occured for many reasons. First, we teach staff the entire process. They understand not just how but also why. They also understand how their actions impact patient outcomes both good and bad. Additionally, communication is always encouraged. We work to improve communication on the floor for day-to-day management of clinical activities. Supervisors provide regular feedback and continuing education to staff through communication meetings. Further, they solicit staff's input and recommendations to continue the facilities' success. Administratively, we have a formalized quality assurance program which provides monthly reports to each facility. At this level, assistance is routinely provided to all facilities as needed.

Table X

External Access

- Continuous systemic heparinization
- Loading dose based on body weight (given 3 min. before dialysis)
  - 3000u if 45kg or less
  - 4000 - 5000u if 45-68 kg
  - 6000-7000u if 68 kg or greater
  - Reduce 1000 - 2000u for risk patients
- Typical infusion is 1000u/hr until takeoff
  - Increase to 1500u for large patients and clotters
  - Reduce to 500u for risk patients
- ACT typically not performed
- Close visual monitoring of extracorporeal circuit
- Reuse staff notify nursing regarding low TCV, poor appearance or large drop in TCV.

Finally, certain key procedural points have been very important in this process. The pre-dialysis loading bolus must be given 3-5 minutes before initiating dialysis. Staff must be aware of any change in treatment orders and non-dialysis orders such as medication prescriptions. Changes to dialyzer model, treatment length, blood flow rates, or medications may require a change in heparin. The patient's physical condition must always be evaluated. Problems during dialysis, i.e. blood flow, must be identified. Reuse procedures must be initiated immediately following dialysis. Large volume drops or poor cleaning during reuse procedures must be identified.

This may appear to be very involved and complicated. At first, it appeared that way to us. However, by involving staff and planning how to integrate these practices into our system, we have found few problems. In fact, in many ways, it has eliminated some problems. Most importantly, though, our patients benefit. They lose less blood and their dialyzers retain clearances longer. This has enabled us to focus more completely on total patient care management.

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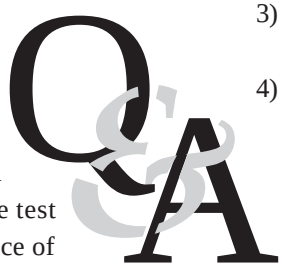
Q. What is the difference between Renal Systems' two Renalin® presence tests?

A. Renal Systems has two Renalin presence tests :

The *Renalin® Indicator Test Strip Kit* is a qualitative indication of the presence of Renalin® solution in reprocessed dialyzers prior to preparing them for patient use. Performing this test requires a dilution step prior to dipping the strip into the solution being tested. To do this, use the provided calibrated vial and combine 1ml of solution from the dialysate compartment of the reprocessed dialyzer with 7 ml of AAMI quality water prior to dipping the test strip. A positive result confirms the presence of Renalin® solution, but provides no indication of concentration.



The *Perassay™ 500 Peracetic Acid Test Strip* provides a quantitative measurement of the level of peracetic acid in Renalin® solution. A sample of Renalin® solution is collected from the dialysate compartment of a reprocessed dialyzer and tested by means of a simple "dip and read" procedure, with no need for sample dilution. A positive result confirms the presence of Renalin® solution with a peracetic acid concentration of 500 ppm (mg/l) or greater. Peracetic acid is the primary sterilizing agent in Renalin® solution with 500 ppm being a level known to be effective for sporicidal activity.

Confirming the presence of Renalin® solution in reprocessed dialyzers prior to preparing them for patient use is an essential step in safe reuse practices. Either test method is well-suited for this purpose, although each has its unique advantages. The Renalin® Indicator Test Strip is less expensive and thus offers the potential for greater cost-effectiveness. The Perassay™ 500 Peracetic Acid Test Strip is more convenient to use and a quantitative indication of the level of peracetic acid.

The decision as to which presence test to use is up to the facility and its medical director. A facility may choose to use a combination of both the Perassay™ 500 Peracetic Acid Test Strips and Renalin® Indicator Test Strips.

Q. The Renatron® II Dialyzer Reprocessing System has an additional pre-clean feature. This process is initiated by scanning the pre-clean barcode on the Renatron® station. How do you perform a pre-clean cycle with a non-computerized Renatron?

A. A pre-clean cycle is an option for the hard-to-clean USED dialyzer.

1) Determine which dialyzers would benefit from the pre-clean cycle.
2) Mark or label these dialyzers to indicate they are at the pre-clean stage and will need to be completely reprocessed before storage.
3) Following the Instructions for Use manual, connect the dialyzer to the Renatron®.
4) Select the appropriate reprocessing mode for the dialyzer's ultrafiltration rate (Kuf):

MODE	Kuf, ml/hr/mmHg
00	0 - 8
CH	9 - 15
HF	16 and greater

Note: To prevent air from entering the dialyzer, it is important to pre-clean the dialyzer in the appropriate mode as outlined above.

5) Set the minimum volume as recorded on the dialyzer label.
6) Press "Start Process" to initiate reprocessing.
7) Press the "OFF" button at any time during Step 18. At this point, the dialyzer will be filled with Renalin® solution (at a concentration suitable for cleaning but not sterilization).
8) Remove the dialyzer from the Renatron® according to the procedure in Renatron® Instructions for Use manual. Cap the blood and dialysate ports. One dialysate port may be uncapped and left open to atmosphere or a vented port cap may be placed on one dialysate port and should be vented prior to removal.
9) Isolate the dialyzer in a pre-clean only designated area or bin. Place the dialyzer with the dialysate ports pointing upward. Allow the dialyzer to soak/dwell for up to two hours (a two hour soak/dwell time is based on the optimal time observed for Renalin®-assisted dialyzer cleaning).

Note: It is very important that pre-cleaned dialyzers be separated from fully- reprocessed dialyzers during the soak/dwell phase so they are not mistaken for a fully-reprocessed dialyzer. ***The concentration of Renalin® solution in these dialyzers is lower than intended for sterilization.***

10) After the soak/dwell time, remove the port caps from the dialyzer and empty the Renalin® solution into an appropriate drain.
11) Reconnect the dialyzer to the Renatron® and proceed with a complete reprocessing cycle.

What *IS* a Sterilant, Anyway?

By Patricia Stanley, Ph.D.
Microbiologist, Minntech Corporation

"All" you want to do is make sure your patient won't get an infection from a previously used dialyzer. So do you use a disinfectant, a virucide, a sterilant, a sporicide, a germicide, or an antiseptic? How are all these terms defined and how do you select the proper product?

The definition of a product designed to destroy microorganisms often depends on its spectrum of activity. Thus, a virucide kills viruses and a tuberculocide will destroy the causative agent of tuberculosis. High level disinfectants kill all microbes except high numbers of bacterial spores. A sporicide is effective against bacterial spores, generally considered the hardest life forms to destroy. The term germicide has a broader "definition" and is applied to any chemical which will kill "germs" or harmful microorganisms. The term sterilant can only be used to describe a chemical that destroys all life forms and thus sterilizes the surface to which it is applied.

Since dialyzers are critical articles that contact a patient's blood, they need to be free of microorganisms. The disease-causing microbes must be eliminated so that the patient does not develop an infection. Non-pathogenic microbes should not be allowed to grow either since many of them can produce pyrogenic material. Therefore, the dialyzer should be reprocessed immediately after use. The 1993 AAMI Guidelines for the Reuse of Hemodialyzers state that "the rinsed and cleaned dialyzer must be treated by a process that prevents adverse effects due to microbial contamination. The blood and dialysate compartments of the dialyzer must be sterilized or subjected to high level disinfection because inadequate germicide can result in infection in the patient."

Before a germicide can be legally marketed as a sterilant, it must be shown to be effective by a rigorous test method that was originally developed by the Association of Official Analytical Chemists (AOAC). The members of this independent organization are scientists from academia, industry, and government agencies. They develop laboratory procedures for many different purposes including the efficacy testing of germicides. The test for sterilants involves inoculating bacterial spores onto a small porcelain cylinder or small loop made of silk suture. These two devices are model surfaces that provide plenty of crevices for the spores to "hide" in and be protected from the sterilant. The loop and cylinder are submerged in the sterilant solution for the specified exposure period then are removed and placed in a nutrient solution that will support the growth of any survivors. The test is repeated 60 times for each carrier, against two types of spore challenge, using 3 different lots of sterilant. That's 720 repetitions! All of the cylinders and loops must be free of surviving microbes -- zero tolerance for failure. It is generally accepted in the scientific / regulatory community that if a product will destroy spores, it will be effective against all other microbes and thus can be called a sterilant.

Renalin® sterilant has been proven to be a sterilant by use of the AOAC test method. It must, of course, be diluted to the proper concentration (3.25 - 3.5%) and kept in contact with the dialyzer for the require exposure period (11 hours). Dialyzer headers do not need to be removed for the reprocessing procedure, however, if they are removed to clean the header surface, all exposed components must be disinfected. If the required procedures are followed, you can be satisfied that the previously used dialyzer may be safely used for the next treatment.

Evaluation of Primus® High Flux Polysulfone Dialyzers

By Peter Beasley, Reuse Technician*
Independent Dialysis Foundation, An Affiliate of University of Maryland

In January, my unit (Independent Dialysis Foundation) started evaluating the Primus 1350 dialyzer and comparing its clearances and reusability to another polysulfone dialyzer that we were currently using.

I not only work as a Reuse Technician, but I am also a dialysis patient who was included in this evaluation. With this in mind, I have a unique perspective concerning reuse and the dialyzers we use.

Since both dialyzers are made out of polysulfone, we did not expect anyone to "feel" any difference and as

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far as I know, no one did. One thing that I did notice is that the Primus® dialyzers seemed to rinse back more completely. If this is true on everyone, it could mean that the patients may not need as much EPO or as frequent blood transfusions.

As far as reusability, before starting the evaluation, the most uses that we had been able to get out of the other polysulfone dialyzers was five. My first Primus® dialyzer lasted for 23 uses. Although my dialyzers were the "best cases", all of the other patients except one also increased by as much as double.

About the Author:

Peter has been a dialysis patient for 11 years. He also has worked as a reuse technician for the past three years.

** The opinions expressed herein are those of the author and do not necessarily reflect the views or opinions of Renal Systems or Minntech Corporation.*

2000th Renatron® Station Placed in Service

By Carla Weaver, Lead Technician
Mount Olympus Kidney Center
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Who bought the 2000th Renatron? Mount Olympus Kidney Center (MOKC) in Port Angeles, Washington did. MOKC opened July 11, 1988 with two patients. Our chronic unit now serves 22 patients. It is owned by the Clallam County Hospital District #2 and is managed by Northwest Kidney Center. Dr. Robert Witham is our medical director and our nurse manager is Debbie Kelly, BSN, RN, CNN. Both have been with our center since its inception.

MOKC serves patients on the Olympic Peninsula from Port Townsend to Neah Bay. In 1993-94, we performed 103 acute treatments for Olympic Memorial Hospital. We are growing at a rate of 15 percent. This growth resulted in 3371 treatments for the 1993-94 year.

Some of our treatments are for visiting patients who are taking in the beautiful Olympic National Park, Hoh Rain Forest or Victoria Canada. The ferry leaves Port Angeles three times daily. Patients can watch the ferry leaving from any of our north windows and, to the south, they have a majestic view of the Olympic Mountains.

Our unit runs five stations, six days a week. Our new Renatron® allows us to reprocess our dialyzers. Out of our 22 patients, 17 have reached 20 or more reuses, 10 of which made it to our maximum use of 30.

Our unit has a small town feeling, just like the town in which it is located. At the same time, we continually strive to improve the quality of care for our patients. In this regard, we are planning to expand to a six station unit. I hope this glimpse of Mount Olympus Kidney Center, the unit that bought the 2000th Renatron®, will tempt you to stop in and say "hi" the next time you are in the area.

Pictured with their new Renatron®II station are (left) Deanna VanWinkle, Reuse Aid, and (right) Carla Weaver, Lead Technician.

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