

Clinical curriculum: Dialysis

1) Goal

Fellows will become competent in caring for patients requiring dialysis therapy.

2) Objectives

Detailed objectives for general nephrology are described in the Dialysis table. There are 4 separate tables that address objectives for each rotation on dialysis. A rotation is defined as a 6-month period, so there are separate objectives for the 1st, 2nd, 3rd and 4th 6-month rotations. These objectives reflect a progressive increase in expectations for fellows' competency achievement. While these are discussed in detail in the table, the essence of the objectives for each 6-month rotation are as follows:

1. Months 1-6 - Fellows function at least at the level of accurate reporting of the history, physical and other data, i.e., they correctly recall and state the relevant facts. Fellows begin to understand or comprehend this information, reviewing and reporting the relevant facts in an organized and efficient manner. Fellows begin to describe how to apply this information to make diagnostic and therapeutic decision.
2. Months 7-12 - Fellows are able to accurately interpret the history, physical examination and data. The information is analyzed and an accurate differential diagnosis is formulated. Fellows are able to perform urinalysis accurately. Fellows continue in their abilities to design a diagnostic plan and therapeutic interventions.
3. Months 13-18 - Fellows are able to correctly manage general nephrology patient care. This extends previous expectations to formulating a correct diagnostic plan, making the correct diagnosis. They should be beginning to critically analyze literature relevant to the care issues.
4. Months 19-24 - Fellows are competent in all six core competencies. They function as self-educators, reading and analyzing the literature, and adjusting their care based on this analysis. They also function as educators in a larger context, using their clinical experience and information they have obtained from the literature to teach their colleagues, staff and faculty.

3) Types of clinical encounters and supervision

1. Inpatient dialysis encounters – Patients requiring acute dialysis are seen at the VA and UH during the 6 months/year on-service by Fellows on the VA or UH rotations. Patients are acutely dialyzed at both hospitals in either the acute dialysis unit or any of the ICUs. Acute hemodialysis, hemofiltration, or CRRT modalities are available at both sites. The fellow is responsible for determining the optimal renal replacement modality and writing the relevant prescription. Fellows also follow chronic dialysis patients admitted with non-dialysis-related problems - the non-dialysis issues are primarily addressed by the resident on service. All acute and chronic dialysis inpatients are seen at the earliest availability and presented in full to the Attending on-service. The Attending sees the patients together with the fellow after the fellow has done the initial evaluation. The fellow then writes and is responsible for dialysis prescription and coordinating and/or performing access placement. The Attending is on-call with the Fellow 24 hours a day.
2. Outpatient dialysis encounters
 - a. VA Hemodialysis Rounds - The VA Fellow attends weekly Outpatient Hemodialysis Rounds at the VA. The rounds are for each of the 4 hemodialysis shifts; these typically occur at varying times during the week depending upon Fellow and Attending availability. A different Attending is permanently assigned to each shift; currently these Attendings are Drs. Beddhu, Cheung, Nelson and Westenfelder. Once a month, these rounds are more comprehensive and involve review of monthly labs and development of a detailed care plan. Patients are seen on dialysis and notes written by the Fellow. In this way, all chronic hemodialysis patients at the VA are seen on a formal basis. These rounds combine quality patient care with concomitant didactic teaching and are an important foundation for learning care of chronic hemodialysis patients. Rounds are made with the nurse, dietician, social worker, Attending and Fellow.
 - b. VA Peritoneal Dialysis Clinic - OP fellows attend this clinic on two Tuesday mornings each month, as the patient volume dictates. It is structured like the Hemodialysis Clinic and is

supervised by Drs. Gregory and Abraham. Like the Hemodialysis Clinic, didactic teaching is particularly emphasized. Patients are seen with the nurse, dietician, social worker, attending and fellow.

- c. University Peritoneal Dialysis Clinic - Fellows see all University PD patients in a continuity manner in clinic on the 2nd and 4th Monday mornings of each month while on the outpatient rotation. About 8 PD patients are seen per clinic. The clinic is supervised by Drs. Gregory and Abraham. Like the Hemodialysis Clinic, didactic teaching is particularly emphasized.

4) Patient characteristics (number, demographics)

1. Inpatients - The average numbers of acute dialysis patients are 1-2 at the VA and 6-8 at UH. The average numbers of chronic dialysis inpatients are 2-4 at the VA and 3-5 at UH. Patient demographics are similar to those for general nephrology patients discussed above.
2. Outpatients – Approximately 650 chronic dialysis patients, including about 65 peritoneal dialysis patients, are followed by the University of Utah Dialysis Program. These patients are dialyzed at ten different centers located in Salt Lake City, Provo, Ogden, Roosevelt, Price, Cedar City, St. George, Rexburg, Layton, and Idaho Falls. There are about 40 chronic hemodialysis patients at the VA. About 10 chronic hemodialysis VA patients attend each dialysis clinic or shift while about 2-3 patients per fellow attend each PD Clinic at the U or VA.

5) Procedural training (also see Dialysis Table)

1. Temporary vascular access – Fellows place internal jugular and femoral vein double lumen catheters for dialysis access. Once fellow competence has been ascertained by the Attending, residents may also place vascular access on their patients. The Fellow will place over 20 temporary vascular access catheters during the Fellowship, however there is no required minimum for number of vascular access catheters placed. Rather, a fellow will be certified as competent in this area by the Program Director on the basis of attending evaluations.
2. Acute hemodialysis – Fellows are trained to perform hemodialysis. Outside of this training, fellows do not dialyze patients themselves; this is done by the dialysis staff.
3. CRRT – Fellows are taught the set-up, indications, contraindications and use of CVVH, CAVH, CVVHD and CAVHD. CVVH and CVVHD can be performed at the VA and UH. The University of Utah Dialysis Program owns 6 CRRT (Prisma) machines and the VA owns 2 machines. Currently, about 10 patients are placed on CRRT weekly at the UH and VA combined.
4. Peritoneal dialysis – Fellows are trained in performing peritoneal dialysis including CAPD and CCPD. Fellows do not perform PD themselves, rather they are trained in all aspects related to the performance of PD. The General Surgeons place Tenckhoff catheters at the VA and UH.

6) Teaching methods (also see Dialysis Table)

1. Educational training
 - a. Handouts - At the beginning of the Fellowship, fellows are given the Handbook of Dialysis (Daugirdas and Ing) and access to UpToDate.
2. Didactic sessions
 - a. Weekly didactic conference – Dialysis issues are covered in detail in the didactic conference held each Friday from 11:30-12:30 PM. Sessions are devoted to hemodialysis issues (including systemic disorders accompanying ESRD, dialysis access, dialyzers, technical aspects, kinetics, and complications), peritoneal dialysis (including indications, mechanics, adequacy, and complications), CRRT, and vascular access placement.
 - b. Primer Course - At the beginning of the Fellowship, a multi-day course (a few hours each day) is given to provide trainees with a basic level of instruction regarding several issues in Nephrology. Those covered relevant to dialysis are hemodialysis and CAPD prescription and acute and chronic complications of hemodialysis and CAPD and their management.
3. Conferences – Fellows must attend the following conferences:
 - a. Nephrology Clinical Conference - See General Nephrology Section for details. General nephrology, dialysis and transplant cases are discussed in the setting of case-based presentations, Landmark articles review, M&M, and journal club.

- b. 5 PM Nephrology Conference – See General Nephrology section for details. About seven conferences are devoted to dialysis yearly.
- 4. Inpatient attending rounds – See under Types of Clinical Encounters above.
- 5. Outpatient hemodialysis and peritoneal dialysis rounds – See under Clinical Encounters above. Note that interdisciplinary interactions are a key part of these clinics.

7) Assessment and evaluation of Fellows (also see Dialysis Table)

1. Clinical encounters – A variety of instruments are used to assess Fellow performance. The specific evaluation utilized is indicated in the Dialysis Table. These include:
 - a. Checklist
 - 1) Fellows are evaluated at the end of each 2-week block with a given attending. The attending uses a scale from 1-9 to assess patient care knowledge, skills, attitudes and behaviors. Fellows review these orally with the attending and both individuals sign the review form. If there is any significant issue, the attending immediately communicates this to the Program Director who meets with the attending and fellow to develop an action plan to address the issue. The Fellow's performance in this area is then reassessed, by Checklist by the inpatient attendings, in one month and reviewed with the Program Director. During the first 6 months of fellowship, all scores must be "5" (satisfactory) or higher; scores under this will be reviewed with the Program Director, specific problem areas identified, and the appropriate corrective action taken. The problem areas are re-evaluated in one month. During the second 6 months (7-12 months of training), scores must average "6" or over; during the third 6 months (13-18 months of training), scores must average "7" or over; and during the fourth and final 6 months (19-24 months), scores must average "8" or above. If these ratings are not obtained, the same steps are taken as discussed above..
 - 2) Fellows are evaluated by the Program Director and the Dialysis Director (Dr. Beddhu) every 6 months. First, the goals and objectives are reviewed for the upcoming six months. These Directors use a scale from 1-9 to evaluate the Fellow's patient care, medical knowledge, professionalism, interpersonal and communication skills, practice-based learning and improvement, and systems-based practice as it pertains to dialysis. Fellows review this with the Program Director. The evaluation is based on review of the attending checklists, 360 degree evaluations (see below), and any other pertinent information. Importantly, this evaluation is also based on semi-annual discussions between all the clinical faculty and the Program and Dialysis Directors. If any significant issues exist, an action plan is developed and the fellow re-evaluated by the Program and Dialysis Directors in 6 months using the same evaluation measurements as above. In addition, even if no significant issues are identified, goals are established for the fellow to work on over the next 6 months. These goals typically do not reflect needed attention to sub-par performance, but instead are intended to help the Fellow focus efforts. For example, faculty may note that the fellow did relatively few CRRTs, placed relatively few dialysis catheters, or that attending comments reflected a need to increased dialysis knowledge base – appropriate recommendations to work on these areas would be made, and progress evaluated at the next semi-annual Program and Dialysis Director review.
 - b. 360 evaluation – this evaluation is completed by dialysis technicians, dialysis nurses, social workers, dieticians, pharmacists, and nurse practitioners in order to give a broad sense of how the Fellow delivers patient care and interacts with members of the dialysis health care interdisciplinary team. It is completed every 6 months. Fellows review this with the Program Director. Problem areas (scores under "5") are identified and an action plan developed. Fellows are reassessed in 6 months with particular attention to these problem areas.
 - c. Patient surveys – Over the course of the year, 5-10 different patients are asked to complete a form rating dialysis patient interaction. These are reviewed annually with the Program Director. Areas in need of improvement are identified and reassessed, by patient survey, within 3 months. These evaluations are not fellow-specific, since fellows do not follow dialysis patients on a continuity basis (except for continuity physical examinations). However, fellows are involved in discussion of the patient surveys and identification of areas for improvement.

- d. Written exam – In the spring of the first year, Fellows take the American Society of Nephrology In-Training Examination. Their performance is reviewed with the Program Director. Dialysis areas in need of improvement are identified (defined as missing more than 2 questions in that area) and an action plan is developed to address these. Fellow's fund of knowledge in these areas is reassessed in three months by performance on the relevant NephSAP or by satisfactorily answering questions from the Dialysis Director.
 - e. Resident portfolio – Please see details under General Nephrology section. A fellow's project may be in the transplant area, if deemed appropriate by the Dialysis Director.
 - f. Mini-clinical examination (Mini-CEX) – These are given about four times in the first year, in the inpatient and outpatient setting, to provide formative input on the fellow's progression towards obtaining clinical competence relevant to dialysis patient care.
2. Procedures – Fellows are required to keep a log of temporary vascular access procedures (for hemodialysis or CRRT). Competence is determined by supervising attendings; there is no minimum number of temporary vascular access procedures required. Once deemed competent, fellows may place temporary vascular access without direct attending supervision of the procedure. There is no defined minimum requirement for number of hemodialysis, PD or CRRT patients.
 3. Conferences – Fellows attendance at conferences is documented. Participation in journal clubs, case-based presentations, and Landmark articles review, as they relate to dialysis, is discussed with the Program Director during the 6-month evaluation.
 4. Final (summative) evaluation - This evaluation includes a review of the Fellow's performance during the final period of education, and verifies that the Fellow demonstrated sufficient professional ability to practice competently and independently

8) Assessment and evaluation of attendings by Fellows - discussed in section below devoted to this topic.

Dialysis Table - Months 1-6

Competency category	Competency objectives	Dialysis objectives relevant to competency	Teaching Methods	Evaluation Methods	Acceptable Performance
Patient care	Exhibit caring and respectful behaviors	Exhibit caring and respectful behaviors towards dialysis patients	Attending teaching Conferences Core lectures Orientation	Patient surveys 360 evaluation Checklist Mini-CEX	≤10% unacceptable ≥ 5 ≥ 5 Formative
	Gather essential and accurate information about their patients	Gather essential information about fellow's dialysis patient	Attending teaching Conferences Core lectures	Checklist 360 evaluation Mini-CEX	≥ 5 ≥ 5 Formative
	Make informed decisions about diagnostic and therapeutic interventions	Begin to understand the basics of making informed decisions about diagnostic and therapeutic interventions in dialysis patients	Attending teaching Conferences Core lectures	Checklist Mini-CEX	≥ 5
	Develop and carry out patient management plans	Begin to develop dialysis patient management plans	Attending teaching Conferences Core lectures	Checklist 360 evaluation	≥ 5 ≥ 5
	Counsel and educate patients and families	Counsel and educate, with direct attending supervision, dialysis patients and families with regard to dialysis modalities, socioeconomic, support systems, dialysis withdrawal, diet, lifestyle, medications	Attending teaching Conferences Core lectures Interdisciplinary rounds	Checklist 360 evaluation Mini-CEX	≥ 5 ≥ 5 Formative
	Use information technology	Use information technology to assist caring for dialysis patients, including UpToDate, NIH information and databases, NephSAP, electronic medical records, PubMed, and other sources	Attending teaching Conferences Orientation	Checklist	≥ 5
	Perform: Physical exam	Examine the dialysis patient, particularly with regard to dialysis-related problems, vascular access site identification and evaluation of access function and infection	Attending teaching Conferences Core lectures	Checklist Mini-CEX	≥ 5 Formative
	Perform: Procedures	Understand the principles of informed consent, indications, contraindications, alternative procedures, and the risks and benefits, and understand the correct procedural techniques for: 1. Temporary vascular access (competent in procedure also) 2. Hemodialysis, peritoneal dialysis, and CRRT	Attending teaching Conferences Core lectures	Checklist	≥ 5 ≥ 5
	Provide preventative health care services	Understand preventative health care services relevant to dialysis patients, including following DOQI guidelines for prevention of anemia, maintenance of accepted serum chemistries, and optimization of dialysis delivery	Interdisciplinary rounds Conferences Attending teaching	Checklist	≥ 5
	Work within a team of health care professionals	Work within the dialysis health care team, including attendings, nurses, dieticians, social workers, physician extenders, pharmacists, technicians, administrators and administrative assistants	Interdisciplinary rounds Conferences Attending teaching Orientation	Checklist 360 evaluation	≥ 5 ≥ 5

Medical knowledge	Demonstrate investigatory and analytic thinking about clinical situations	Begin to demonstrate investigatory and analytic thinking about clinical dialysis situations	Attending teaching Core lectures Conferences Journal club Clinical meetings Orientation	Checklist Mini-CEX	≥ 5 Formative
	Know and apply the basic and clinically supportive sciences	<p>Fellows will gather the data and begin to develop the fund of knowledge necessary for:</p> <ol style="list-style-type: none"> a. Evaluation and selection of patients for acute hemodialysis or CRRT b. Evaluation of ESRD patients for various forms of therapy c. Drug dosage modification during dialysis and other extra-corporeal therapies d. Evaluation and management of medical complications in patients during and between dialyses and other extra-corporeal therapies, and an understanding of their pathogenesis and prevention e. Long-term follow-up of patients undergoing chronic dialysis including their dialysis prescription modification and assessment of adequacy of dialysis f. An understanding of the principles and practice of peritoneal dialysis including the establishment of peritoneal access, the principles of dialysis catheters, and how to choose appropriate catheters. g. An understanding of the technology of peritoneal dialysis including the use of cyclers h. Assessment of peritoneal dialysis efficiency using peritoneal equilibration testing and the principles of peritoneal biopsy i. An understanding of how to write a peritoneal dialysis prescription and how to assess peritoneal dialysis adequacy j. The pharmacology of commonly used medications and their kinetic and dosage alteration with peritoneal dialysis k. An understanding of the complications of peritoneal dialysis including peritonitis and its treatment, exit site and tunnel infections and their management, hernias, pleural effusions and other less common complications and their management l. An understanding of the special nutritional requirements of the hemodialysis and peritoneal dialysis patient m. An understanding of the psychosocial, economic and ethical issues of dialysis n. An understanding of dialysis water treatment, delivery systems and dialyzer reuse o. An understanding of end-of-life care and pain management in the care of patients undergoing chronic dialysis, including psychosocial, cultural, and religious issues related to death and dying 	Attending teaching Core lectures Conferences Journal club Clinical meetings Orientation	Checklist Mini-CEX	≥ 5 Formative

		<p>p. An understanding of the radiologic evaluation of dialysis access, including its indications, contraindications, complications and interpretations of results, as well as their cost-effectiveness and application to patient care</p> <p>q. An understanding of balloon angioplasty of vascular access, including its indications, contraindications, complications and interpretations of results, as well as their cost-effectiveness and application to patient care</p>	<p>Attending teaching</p> <p>Core lectures</p> <p>Conferences</p> <p>Journal club</p> <p>Clinical meetings</p> <p>Orientation</p>	<p>Checklist</p> <p>Mini-CEX</p>	<p>≥ 5</p> <p>Formative</p>
Practice-based learning and improvement	Analyze own practice and perform practice-based improvement using a systematic methodology	<p>Fellow will hold up a mirror to themselves to document, assess, and improve their practice. This will involve:</p> <p>a. Monitoring their practice</p> <p>b. Reflecting on or analyzing their practice to identify learning or improvement needs</p> <p>c. Engaging in a learning or plan improvement</p>	<p>Attending teaching</p> <p>Case-based presentations on fellow's own pts.</p> <p>Journal club</p> <p>Participation in CQI activities</p> <p>Exit rounds on patient discharge</p> <p>M&M on fellow's own patients</p> <p>Conferences</p> <p>Log of significant events and plan to address</p> <p>Assigned faculty mentor</p>	<p>Fellow portfolio (Fellow catalogues over time questions and issues that arose during patient care activities along with copies of the data sources used, and actions taken, to address the specific question or issue).</p>	<p>Completed PIM</p> <p>8 case-based talks</p> <p>8 journal clubs</p> <p>4 M&M</p> <p>≥ "5", Yr 2 avg. ≥ 7 on checklists</p> <p>Log of ≥2 significant events, how addressed, and results</p> <p>Fellow/faculty initiated project (PIM is an alternative)</p>
	Use evidence from scientific studies related to patients' health problems	Use evidence from scientific studies related to dialysis patients' health problems	<p>Attending teaching</p> <p>Case-based presentations on fellow's own pts.</p> <p>Journal club</p>	Checklist	≥ 5
	Apply knowledge of study designs and statistical methods to appraising clinical studies and other information	Begin to understand study designs and statistical methods to appraising clinical studies and other information	<p>Statistics and epidemiology course</p> <p>Conferences</p> <p>Journal club</p> <p>Assigned faculty mentor</p>	Checklist	≥ 5
	Use information technology	Use information technology as itemized in Patient Care above	<p>Attending teaching</p> <p>Orientation</p> <p>Conferences</p>	<p>Checklist</p> <p>Resident portfolio</p>	<p>≥ 5</p> <p>See "Analyze own practice..." above</p>
	Facilitate the learning of others	Facilitate the learning of others, including faculty, residents, fellows, physician extenders, nurses and dialysis technicians	<p>Role models</p> <p>Attending teaching</p> <p>Conferences</p>	<p>Checklist</p> <p>360 evaluation</p>	<p>≥ 5</p> <p>≥ 5</p>

Interpersonal & communication skills	Maintain a therapeutic and ethical relationship with patients	Maintain a therapeutic and ethical relationship with dialysis patients	Role models Attending teaching Conferences Core lectures	Checklist 360 evaluation Patient surveys	≥ 5 ≥ 5 ≤10% unacceptable
	Demonstrate effective listening and writing skills	Demonstrate effective listening and writing skills	Role models Attending teaching	Checklist 360 evaluation Mini-CEX	≥ 5 ≥ 5 Formative
Professionalism	Demonstrate respect, compassion, and integrity	Demonstrate respect, compassion, and integrity	Role models Attending teaching	Checklist 360 evaluation Patient surveys Mini-CEX	≥ 5 ≥ 5 ≤10% unacceptable Formative
	Demonstrate an ethically sound practice	Demonstrate an ethically sound practice	Role models Attending teaching Conferences	Checklist 360 evaluation	≥ 5 ≥ 5
	Demonstrate sensitivity to patients' culture, age, gender, and disabilities	Demonstrate sensitivity to patients' culture, age, gender, and disabilities	Role models Attending teaching Conferences	Checklist 360 evaluation Patient surveys Mini-CEX	≥ 5 ≥ 5 ≤10% unacceptable Formative
Systems-based practice	Understand interaction of their practices with the larger system	Begin to understand interaction between fellow's practice and the dialysis unit staff, unit administration, surgical service, radiology, medical consult services, the clinic, and the hospital	Interdisciplinary rounds Conferences Attending teaching Dialysis director & administrator didactic teaching	360 evaluation	≥ 5
	Understand types of medical practice and delivery systems	Begin to understand how types of dialysis units and providers deliver dialysis care	Conferences Attending teaching Dialysis director & administrator didactic teaching	Checklist	≥ 5
	Practice cost-effective health care	Begin to understand how to practice cost-effective dialysis care	Conferences Core lectures Attending teaching	Checklist 360 evaluation	≥ 5 ≥ 5
	Advocate for quality patient care	Begin to understand how to advocate for dialysis patient quality care by demonstrating proactive efforts towards dialysis CQI	Attending teaching Participation in CQI Conferences	Checklist 360 evaluation	≥ 5 ≥ 5

Dialysis Table - Months 7-12

Competency category	Competency objectives	Dialysis objectives relevant to competency	Teaching Methods	Evaluation Methods	Acceptable Performance
Patient care	Exhibit caring and respectful behaviors	Exhibit caring and respectful behaviors towards dialysis patients	Attending teaching Conferences Core lectures	Patient surveys 360 evaluation Checklist Mini-CEX	≤10% unacceptable ≥ 6 ≥ 6 Formative
	Gather essential and accurate information about their patients	Gather essential information about fellow's dialysis patient	Attending teaching Conferences Core lectures	Checklist 360 evaluation Mini-CEX	≥ 6 ≥ 6 Formative
	Make informed decisions about diagnostic and therapeutic interventions	Synthesize data to begin to make informed decisions about diagnostic and therapeutic interventions in dialysis patients	Attending teaching Conferences Core lectures	Checklist	≥ 6
	Develop and carry out patient management plans	Develop dialysis patient management plans. Understand how to carry out such plans.	Attending teaching Conferences Core lectures	Checklist 360 evaluation	≥ 6 ≥ 6
	Counsel and educate patients and families	Counsel and educate dialysis patients and families with regard to dialysis modalities, socioeconomic, support systems, dialysis withdrawal, diet, lifestyle, medications	Attending teaching Conferences Core lectures Interdisciplinary rounds	Checklist 360 evaluation Mini-CEX	≥ 6 ≥ 6 Formative
	Use information technology	Use information technology to assist caring for dialysis patients, including UpToDate, NIH information and databases, NephSAP, electronic medical records, PubMed, and other sources	Attending teaching Conferences	Checklist	≥ 6
	Perform: Physical exam	Examine the dialysis patient, particularly with regard to dialysis-related problems, vascular access site identification and evaluation of access function and infection	Attending teaching Conferences Core lectures	Checklist Mini-CEX	≥ 6 Formative
	Perform: Procedures	Understand the principles of informed consent, indications, contraindications, alternative procedures, and the risks and benefits, and demonstrate the correct procedural techniques for: 1. Temporary vascular access for hemodialysis 2. Hemodialysis, peritoneal dialysis, and CRRT	Attending teaching Conferences Core lectures	Checklist	≥ 6
	Provide preventative health care services	Provide preventative health care services relevant to dialysis patients, including following DOQI guidelines for prevention of anemia, maintenance of accepted serum chemistries, and optimization of dialysis delivery	Interdisciplinary rounds Conferences Attending teaching	Checklist	≥ 6
	Work within a team of health care professionals	Work within the dialysis health care team, including attendings, nurses, dieticians, social workers, physician extenders, pharmacists, technicians, administrators and administrative assistants	Interdisciplinary rounds Conferences Attending teaching	Checklist 360 evaluation	≥ 6 ≥ 6

Medical knowledge	Demonstrate investigatory and analytic thinking about clinical situations	Demonstrate investigatory and analytic thinking about clinical dialysis situations	Attending teaching Core lectures Conferences Journal club Clinical meetings	Checklist ASN In-training examination	≥ 6 Formative
	Know and apply the basic and clinically supportive sciences	<p>Fellows will increase their fund of knowledge necessary for:</p> <ul style="list-style-type: none"> a. Evaluation and selection of patients for acute hemodialysis or CRRT b. Evaluation of ESRD patients for various forms of therapy c. Drug dosage modification during dialysis and other extra-corporeal therapies d. Evaluation and management of medical complications in patients during and between dialyses and other extra-corporeal therapies, and an understanding of their pathogenesis and prevention e. Long-term follow-up of patients undergoing chronic dialysis including their dialysis prescription modification and assessment of adequacy of dialysis f. An understanding of the principles and practice of peritoneal dialysis including the establishment of peritoneal access, the principles of dialysis catheters, and how to choose appropriate catheters. g. An understanding of the technology of peritoneal dialysis including the use of cyclers h. Assessment of peritoneal dialysis efficiency using peritoneal equilibration testing and the principles of peritoneal biopsy i. An understanding of how to write a peritoneal dialysis prescription and how to assess peritoneal dialysis adequacy j. The pharmacology of commonly used medications and their kinetic and dosage alteration with peritoneal dialysis k. An understanding of the complications of peritoneal dialysis including peritonitis and its treatment, exit site and tunnel infections and their management, hernias, pleural effusions and other less common complications and their management l. An understanding of the special nutritional requirements of the hemodialysis and peritoneal dialysis patient m. An understanding of the psychosocial, economic and ethical issues of dialysis n. An understanding of dialysis water treatment, delivery systems and dialyzer reuse o. An understanding of end-of-life care and pain management in the care of patients undergoing chronic dialysis, including psychosocial, cultural, and religious issues related to death and dying 	Attending teaching Core lectures Conferences Journal club Clinical meetings	ASN In-training examination Mini-CEX	Formative Formative

		<p>p. An understanding of the radiologic evaluation of dialysis access, including its indications, contraindications, complications and interpretations of results, as well as their cost-effectiveness and application to patient care</p> <p>q. An understanding of balloon angioplasty of vascular access, including its indications, contraindications, complications and interpretations of results, as well as their cost-effectiveness and application to patient care</p>	<p>Attending teaching</p> <p>Core lectures</p> <p>Conferences</p> <p>Journal club</p> <p>Clinical meetings</p> <p>Orientation</p>	<p>Checklist</p> <p>ASN In-training examination</p>	<p>≥ 6</p> <p>Formative</p>
Practice-based learning and improvement	Analyze own practice and perform practice-based improvement using a systematic methodology	Fellow will hold up a mirror to themselves to document, assess, and improve their practice. This will involve: <ul style="list-style-type: none"> a. Monitoring their practice b. Reflecting on or analyzing their practice to identify learning or improvement needs c. Engaging in a learning or plan improvement 	<p>Attending teaching</p> <p>Case-based presentations on fellow's own pts.</p> <p>Journal club</p> <p>Participation in CQI activities</p> <p>Exit rounds on patient discharge</p> <p>M&M on fellow's own patients</p> <p>Conferences</p> <p>Log of significant events and plan to address</p> <p>Assigned faculty mentor</p>	Fellow portfolio (Fellow catalogues over time questions and issues that arose during patient care activities along with copies of the data sources used, and actions taken, to address the specific question or issue).	<p>12 case-base talks*</p> <p>12 journal clubs*</p> <p>2 M&M*</p> <p>≥ 6 on checklists</p> <p>Log of 2 significant events and how addressed</p> <p>CQI project data analyzed and improvement plan developed</p> <p>*Conference performance evaluated by TPD</p>
	Use evidence from scientific studies related to patients' health problems	Use evidence from scientific studies related to dialysis patients' health problems	<p>Attending teaching</p> <p>Case-based presentations on fellow's own pts.</p> <p>Journal club</p>	ASN In-training examination	Formative
	Apply knowledge of study designs and statistical methods to appraising clinical studies and other information	Apply knowledge of study designs and statistical methods to appraising clinical studies and other information	<p>Statistics and epidemiology course</p> <p>Conferences</p> <p>Journal club</p> <p>Assigned faculty mentor</p>	ASN In-training examination	Formative
	Use information technology	Use information technology as itemized in Patient Care above	<p>Attending teaching</p> <p>Orientation</p> <p>Conferences</p>	<p>Checklist</p> <p>Resident portfolio</p>	<p>≥ 6</p> <p>See "Analyze own practice..." above</p>
	Facilitate the learning of others	Facilitate the learning of others, including faculty, residents, fellows, physician extenders, nurses and dialysis technicians	<p>Role models</p> <p>Attending teaching</p> <p>Conferences</p>	<p>Checklist</p> <p>360 evaluation</p>	<p>≥ 6</p> <p>≥ 6</p>

Interpersonal & communication skills	Maintain a therapeutic and ethical relationship with patients	Maintain a therapeutic and ethical relationship with dialysis patients	Role models Attending teaching Conferences Core lectures	Checklist 360 evaluation Patient surveys	≥ 6 ≥ 6 ≤10% unacceptable
	Demonstrate effective listening and writing skills	Demonstrate effective listening and writing skills	Role models Attending teaching	Checklist 360 evaluation Mini-CEX	≥ 6 ≥ 6 Formative
Professionalism	Demonstrate respect, compassion, and integrity	Demonstrate respect, compassion, and integrity	Role models Attending teaching	Checklist 360 evaluation Patient surveys Mini-CEX	≥ 6 ≥ 6 ≤10% unacceptable Formative
	Demonstrate an ethically sound practice	Demonstrate an ethically sound practice	Role models Attending teaching Conferences	Checklist 360 evaluation	≥ 6 ≥ 6
	Demonstrate sensitivity to patients' culture, age, gender, and disabilities	Demonstrate sensitivity to patients' culture, age, gender, and disabilities	Role models Attending teaching Conferences	Checklist 360 evaluation Patient surveys Mini-CEX	≥ 6 ≥ 6 ≤10% unacceptable Formative
Systems-based practice	Understand interaction of their practices with the larger system	Understand interaction between fellow's practice and the dialysis unit staff, unit administration, surgical service, radiology, medical consult services, the clinic, and the hospital	Interdisciplinary rounds Conferences Attending teaching Dialysis director & administrator didactic teaching	Checklist 360 evaluation	≥ 6 ≥ 6
	Understand types of medical practice and delivery systems	Understand how types of dialysis units and providers deliver dialysis care	Conferences Attending teaching Dialysis director & administrator didactic teaching	ASN In-training examination	Formative
	Practice cost-effective health care	Practice cost-effective dialysis care	Conferences Core lectures Attending teaching	Checklist 360 evaluation	≥ 6 ≥ 6
	Advocate for quality patient care	Advocate for dialysis patient quality care by demonstrating proactive efforts towards dialysis CQI	Attending teaching Participation in CQI Conferences	Checklist 360 evaluation	≥ 6 ≥ 6

Dialysis Table - Months 13-18

Competency category	Competency objectives	Dialysis objectives relevant to competency	Teaching Methods	Evaluation Methods	Acceptable Performance
Patient care	Exhibit caring and respectful behaviors	Exhibit caring and respectful behaviors towards dialysis patients	Attending teaching Conferences Core lectures	Patient surveys 360 evaluation Checklist	≤10% unacceptable ≥ 7 ≥ 7
	Gather essential and accurate information about their patients	Gather essential information about fellow's dialysis patient	Attending teaching Conferences Core lectures	Checklist 360 evaluation	≥ 7 ≥ 7
	Make informed decisions about diagnostic and therapeutic interventions	Make informed decisions about diagnostic and therapeutic interventions in dialysis patients	Attending teaching Conferences Core lectures	Checklist	≥ 7
	Develop and carry out patient management plans	Develop and carry out dialysis patient management plans	Attending teaching Conferences Core lectures	Checklist 360 evaluation	≥ 7 ≥ 7
	Counsel and educate patients and families	Counsel and educate dialysis patients and families with regard to dialysis modalities, socioeconomics, support systems, dialysis withdrawal, diet, lifestyle, medications	Attending teaching Conferences Core lectures Interdisciplinary rounds	Checklist 360 evaluation	≥ 7 ≥ 7
	Use information technology	Use information technology to assist caring for dialysis patients, including UpToDate, NIH information and databases, NephSAP, electronic medical records, PubMed, and other sources	Attending teaching Conferences	Checklist	≥ 7
	Perform: Physical exam	Examine the dialysis patient, particularly with regard to dialysis-related problems, vascular access site identification and evaluation of access function and infection	Attending teaching Conferences Core lectures	Checklist	≥ 7
	Perform: Procedures	Understand the principles of informed consent, indications, contraindications, alternative procedures, and the risks and benefits, and demonstrate the correct procedural techniques for: 1. Temporary vascular access for hemodialysis 2. Hemodialysis, peritoneal dialysis, and CRRT	Attending teaching Conferences Core lectures	Checklist	≥ 7
	Provide preventative health care services	Provide preventative health care services relevant to dialysis patients, including following DOQI guidelines for prevention of anemia, maintenance of accepted serum chemistries, and optimization of dialysis delivery	Interdisciplinary rounds Conferences Attending teaching	Checklist	≥ 7
	Work within a team of health care professionals	Work within the dialysis health care team, including attendings, nurses, dietitians, social workers, physician extenders, pharmacists, technicians, administrators and administrative assistants	Interdisciplinary rounds Conferences Attending teaching	Checklist 360 evaluation	≥ 7

Medical knowledge	Demonstrate investigatory and analytic thinking about clinical situations	Demonstrate investigatory and analytic thinking about clinical dialysis situations	Attending teaching Core lectures Conferences Journal club Clinical meetings	Checklist	≥ 7
	Know and apply the basic and clinically supportive sciences	<p>Fellows will acquire the fund of knowledge necessary for:</p> <ol style="list-style-type: none"> a. Evaluation and selection of patients for acute hemodialysis or CRRT b. Evaluation of ESRD patients for various forms of therapy c. Drug dosage modification during dialysis and other extra-corporeal therapies d. Evaluation and management of medical complications in patients during and between dialyses and other extra-corporeal therapies, and an understanding of their pathogenesis and prevention e. Long-term follow-up of patients undergoing chronic dialysis including their dialysis prescription modification and assessment of adequacy of dialysis f. An understanding of the principles and practice of peritoneal dialysis including the establishment of peritoneal access, the principles of dialysis catheters, and how to choose appropriate catheters. g. An understanding of the technology of peritoneal dialysis including the use of cyclers h. Assessment of peritoneal dialysis efficiency using peritoneal equilibration testing and the principles of peritoneal biopsy i. An understanding of how to write a peritoneal dialysis prescription and how to assess peritoneal dialysis adequacy j. The pharmacology of commonly used medications and their kinetic and dosage alteration with peritoneal dialysis k. An understanding of the complications of peritoneal dialysis including peritonitis and its treatment, exit site and tunnel infections and their management, hernias, pleural effusions and other less common complications and their management l. An understanding of the special nutritional requirements of the hemodialysis and peritoneal dialysis patient m. An understanding of the psychosocial, economic and ethical issues of dialysis n. An understanding of dialysis water treatment, delivery systems and dialyzer reuse o. An understanding of end-of-life care and pain management in the care of patients undergoing chronic dialysis, including psychosocial, cultural, and religious issues related to death and dying 	Attending teaching Core lectures Conferences Journal club Clinical meetings	Checklist	≥ 7

		<p>p. An understanding of the radiologic evaluation of dialysis access, including its indications, contraindications, complications and interpretations of results, as well as their cost-effectiveness and application to patient care</p> <p>q. An understanding of balloon angioplasty of vascular access, including its indications, contraindications, complications and interpretations of results, as well as their cost-effectiveness and application to patient care</p>	<p>Attending teaching</p> <p>Core lectures</p> <p>Conferences</p> <p>Journal club</p> <p>Clinical meetings</p>	<p>Checklist</p>	<p>≥ 7</p>
Practice-based learning and improvement	Analyze own practice and perform practice-based improvement using a systematic methodology	<p>Fellow will hold up a mirror to themselves to document, assess, and improve their practice. This will involve:</p> <p>a. Monitoring their practice</p> <p>b. Reflecting on or analyzing their practice to identify learning or improvement needs</p> <p>c. Engaging in a learning or plan improvement</p> <p>d. Applying the new learning or improvement</p>	<p>Attending teaching</p> <p>Case-based presentations on fellow's own pts.</p> <p>Journal club</p> <p>Participation in CQI activities</p> <p>Exit rounds on patient discharge</p> <p>M&M on fellow's own patients</p> <p>Conferences</p> <p>Log of significant events and plan to address</p> <p>Assigned faculty mentor</p>	<p>Fellow portfolio (Fellow catalogues over time questions and issues that arose during patient care activities along with copies of the data sources used, and actions taken, to address the specific question or issue).</p>	<p>18 case-base talks*</p> <p>18 journal clubs*</p> <p>3 M&M*</p> <p>≥ 7 on checklists</p> <p>Log of 3 significant events and how addressed</p> <p>CQI project - intervention/begin data analysis</p> <p>*Conference performance evaluated by TPD</p>
	Use evidence from scientific studies related to patients' health problems	Use evidence from scientific studies related to dialysis patients' health problems	<p>Attending teaching</p> <p>Case-based presentations on fellow's own pts.</p> <p>Journal club</p>	<p>Checklist</p>	<p>≥ 7</p>
	Apply knowledge of study designs and statistical methods to appraising clinical studies and other information	Apply knowledge of study designs and statistical methods to appraising clinical studies and other information	<p>Statistics and epidemiology course</p> <p>Conferences</p> <p>Journal club</p> <p>Assigned faculty mentor</p>	<p>Checklist</p>	<p>≥ 7</p>
	Use information technology	Use information technology as itemized in Patient Care above	<p>Attending teaching</p> <p>Conferences</p>	<p>Checklist</p> <p>Resident portfolio</p>	<p>≥ 7</p> <p>See "Analyze own practice..." above</p>
	Facilitate the learning of others	Facilitate the learning of others, including faculty, residents, fellows, physician extenders, nurses and dialysis technicians	<p>Role models</p> <p>Attending teaching</p> <p>Conferences</p>	<p>Checklist</p> <p>360 evaluation</p>	<p>≥ 7</p> <p>≥ 7</p>

Interpersonal & communication skills	Maintain a therapeutic and ethical relationship with patients	Maintain a therapeutic and ethical relationship with dialysis patients	Role models Attending teaching Conferences Core lectures	Checklist 360 evaluation Patient surveys	≥ 7 ≥ 7 ≤10% unacceptable
	Demonstrate effective listening and writing skills	Demonstrate effective listening and writing skills	Role models Attending teaching	Checklist 360 evaluation	≥ 7 ≥ 7
Professionalism	Demonstrate respect, compassion, and integrity	Demonstrate respect, compassion, and integrity	Role models Attending teaching	Checklist 360 evaluation Patient surveys	≥ 7 ≥ 7 ≤10% unacceptable
	Demonstrate an ethically sound practice	Demonstrate an ethically sound practice	Role models Attending teaching Conferences	Checklist 360 evaluation	≥ 7 ≥ 7
	Demonstrate sensitivity to patients' culture, age, gender, and disabilities	Demonstrate sensitivity to patients' culture, age, gender, and disabilities	Role models Attending teaching Conferences	Checklist 360 evaluation Patient surveys	≥ 7 ≥ 7 ≤10% unacceptable
Systems-based practice	Understand interaction of their practices with the larger system	Understand interaction between fellow's practice and the dialysis unit staff, unit administration, surgical service, radiology, medical consult services, the clinic, and the hospital	Interdisciplinary rounds Conferences Attending teaching Dialysis director & administrator didactic teaching	Checklist 360 evaluation	≥ 7 ≥ 7
	Understand types of medical practice and delivery systems	Understand how types of dialysis units and providers deliver dialysis care	Conferences Attending teaching Dialysis director & administrator didactic teaching	Checklist	≥ 7
	Practice cost-effective health care	Practice cost-effective dialysis care	Conferences Core lectures Attending teaching	Checklist 360 evaluation	≥ 7 ≥ 7
	Advocate for quality patient care	Advocate for dialysis patient quality care by demonstrating proactive efforts towards dialysis CQI	Attending teaching Participation in CQI Conferences	Checklist 360 evaluation	≥ 7 ≥ 7

Dialysis Table - Months 19-24

Competency category	Competency objectives	Dialysis objectives relevant to competency	Teaching Methods	Evaluation Methods	Acceptable Performance
Patient care	Exhibit caring and respectful behaviors	Exhibit caring and respectful behaviors towards dialysis patients	Attending teaching Conferences Core lectures	Patient surveys 360 evaluation Checklist	≤10% unacceptable ≥ 8 ≥ 8
	Gather essential and accurate information about their patients	Gather essential information about fellow's dialysis patient	Attending teaching Conferences Core lectures	Checklist 360 evaluation	≥ 8 ≥ 8
	Make informed decisions about diagnostic and therapeutic interventions	Make informed decisions about diagnostic and therapeutic interventions in dialysis patients	Attending teaching Conferences Core lectures	Checklist	≥ 8
	Develop and carry out patient management plans	Develop and carry out dialysis patient management plans	Attending teaching Conferences Core lectures	Checklist 360 evaluation	≥ 8 ≥ 8
	Counsel and educate patients and families	Counsel and educate dialysis patients and families with regard to dialysis modalities, socioeconomics, support systems, dialysis withdrawal, diet, lifestyle, medications	Attending teaching Conferences Core lectures Interdisciplinary rounds	Checklist 360 evaluation	≥ 8 ≥ 8
	Use information technology	Use information technology to assist caring for dialysis patients, including UpToDate, NIH information and databases, NephSAP, electronic medical records, PubMed, and other sources	Attending teaching Conferences	Checklist	≥ 8
	Perform: Physical exam	Examine the dialysis patient, particularly with regard to dialysis-related problems, vascular access site identification and evaluation of access function and infection	Attending teaching Conferences Core lectures	Checklist	≥ 8
	Perform: Procedures	Understand the principles of informed consent, indications, contraindications, alternative procedures, and the risks and benefits, and demonstrate the correct procedural techniques for: 1. Temporary vascular access for hemodialysis 2. Hemodialysis, peritoneal dialysis, and CRRT	Attending teaching Conferences Core lectures	Checklist	≥ 8
	Provide preventative health care services	Provide preventative health care services relevant to dialysis patients, including following DOQI guidelines for prevention of anemia, maintenance of accepted serum chemistries, and optimization of dialysis delivery	Interdisciplinary rounds Conferences Attending teaching	Checklist	≥ 8
	Work within a team of health care professionals	Work within the dialysis health care team, including attendings, nurses, dieticians, social workers, physician extenders, pharmacists, technicians, administrators and administrative assistants	Interdisciplinary rounds Conferences Attending teaching	Checklist 360 evaluation	≥ 8

Medical knowledge	Demonstrate investigatory and analytic thinking about clinical situations	Demonstrate investigatory and analytic thinking about clinical dialysis situations	Attending teaching Core lectures Conferences Journal club Clinical meetings	Checklist	≥ 8
	Know and apply the basic and clinically supportive sciences	Fellows will acquire the fund of knowledge necessary for: a. Evaluation and selection of patients for acute hemodialysis or CRRT b. Evaluation of ESRD patients for various forms of therapy c. Drug dosage modification during dialysis and other extra-corporeal therapies d. Evaluation and management of medical complications in patients during and between dialyses and other extra-corporeal therapies, and an understanding of their pathogenesis and prevention e. Long-term follow-up of patients undergoing chronic dialysis including their dialysis prescription modification and assessment of adequacy of dialysis f. An understanding of the principles and practice of peritoneal dialysis including the establishment of peritoneal access, the principles of dialysis catheters, and how to choose appropriate catheters. g. An understanding of the technology of peritoneal dialysis including the use of cyclers h. Assessment of peritoneal dialysis efficiency using peritoneal equilibration testing and the principles of peritoneal biopsy i. An understanding of how to write a peritoneal dialysis prescription and how to assess peritoneal dialysis adequacy j. The pharmacology of commonly used medications and their kinetic and dosage alteration with peritoneal dialysis k. An understanding of the complications of peritoneal dialysis including peritonitis and its treatment, exit site and tunnel infections and their management, hernias, pleural effusions and other less common complications and their management l. An understanding of the special nutritional requirements of the hemodialysis and peritoneal dialysis patient m. An understanding of the psychosocial, economic and ethical issues of dialysis n. An understanding of dialysis water treatment, delivery systems and dialyzer reuse o. An understanding of end-of-life care and pain management in the care of patients undergoing chronic dialysis, including psychosocial, cultural, and religious issues related to death and dying	Attending teaching Core lectures Conferences Journal club Clinical meetings	Checklist	≥ 8

		<p>p. An understanding of the radiologic evaluation of dialysis access, including its indications, contraindications, complications and interpretations of results, as well as their cost-effectiveness and application to patient care</p> <p>q. An understanding of balloon angioplasty of vascular access, including its indications, contraindications, complications and interpretations of results, as well as their cost-effectiveness and application to patient care</p>	<p>Attending teaching</p> <p>Core lectures</p> <p>Conferences</p> <p>Journal club</p> <p>Clinical meetings</p> <p>Orientation</p>	<p>Checklist</p>	<p>≥ 8</p>
Practice-based learning and improvement	Analyze own practice and perform practice-based improvement using a systematic methodology	Fellow will hold up a mirror to themselves to document, assess, and improve their practice. This will involve: <ul style="list-style-type: none"> a. Monitoring their practice b. Reflecting on or analyzing their practice to identify learning or improvement needs c. Engaging in a learning or plan improvement d. Applying the new learning or improvement e. Monitoring the impact of the learning or improvement 	<p>Attending teaching</p> <p>Case-based presentations on fellow's own pts.</p> <p>Journal club</p> <p>Participation in CQI activities</p> <p>Exit rounds on patient discharge</p> <p>M&M on fellow's own patients</p> <p>Conferences</p> <p>Log of significant events and plan to address</p> <p>Assigned faculty mentor</p>	Fellow portfolio (Fellow catalogues over time questions and issues that arose during patient care activities along with copies of the data sources used, and actions taken, to address the specific question or issue).	<p>24 case-base talks*</p> <p>24 journal clubs*</p> <p>4 M&M*</p> <p>≥ 8 on checklists</p> <p>Log of ≥4 significant events and how addressed</p> <p>CQI project - analysis & reporting</p> <p>*Conference performance evaluated by TPD</p>
	Use evidence from scientific studies related to patients' health problems	Use evidence from scientific studies related to dialysis patients' health problems	<p>Attending teaching</p> <p>Case-based presentations on fellow's own pts.</p> <p>Journal club</p>	<p>Checklist</p>	<p>≥ 8</p>
	Apply knowledge of study designs and statistical methods to appraising clinical studies and other information	Apply knowledge of study designs and statistical methods to appraising clinical studies and other information	<p>Statistics and epidemiology course</p> <p>Conferences</p> <p>Journal club</p> <p>Assigned faculty mentor</p>	<p>Checklist</p>	<p>≥ 8</p>
	Use information technology	Use information technology as itemized in Patient Care above	<p>Attending teaching</p> <p>Orientation</p> <p>Conferences</p>	<p>Checklist</p> <p>Resident portfolio</p>	<p>≥ 8</p> <p>See "Analyze own practice..." above</p>
	Facilitate the learning of others	Facilitate the learning of others, including faculty, residents, fellows, physician extenders, nurses and dialysis technicians. The degree of such education is one of the main differences from the preceding six months.	<p>Role models</p> <p>Attending teaching</p> <p>Conferences</p>	<p>Checklist</p> <p>360 evaluation</p>	<p>≥ 8</p> <p>≥ 8</p>

Interpersonal & communication skills	Maintain a therapeutic and ethical relationship with patients	Maintain a therapeutic and ethical relationship with dialysis patients	Role models Attending teaching Conferences Core lectures	Checklist 360 evaluation Patient surveys	≥ 8 ≥ 8 ≤10% unacceptable
	Demonstrate effective listening and writing skills	Demonstrate effective listening and writing skills	Role models Attending teaching	Checklist 360 evaluation	≥ 8 ≥ 8
Professionalism	Demonstrate respect, compassion, and integrity	Demonstrate respect, compassion, and integrity	Role models Attending teaching	Checklist 360 evaluation Patient surveys	≥ 8 ≥ 8 ≤10% unacceptable
	Demonstrate an ethically sound practice	Demonstrate an ethically sound practice	Role models Attending teaching Conferences	Checklist 360 evaluation	≥ 8 ≥ 8
	Demonstrate sensitivity to patients' culture, age, gender, and disabilities	Demonstrate sensitivity to patients' culture, age, gender, and disabilities	Role models Attending teaching Conferences	Checklist 360 evaluation Patient surveys	≥ 8 ≥ 8 ≤10% unacceptable
Systems-based practice	Understand interaction of their practices with the larger system	Understand interaction between fellow's practice and the dialysis unit staff, unit administration, surgical service, radiology, medical consult services, the clinic, and the hospital	Interdisciplinary rounds Conferences Attending teaching Dialysis director & administrator didactic teaching	Checklist 360 evaluation	≥ 8 ≥ 8
	Understand types of medical practice and delivery systems	Understand how types of dialysis units and providers deliver dialysis care	Conferences Attending teaching Dialysis director & administrator didactic teaching	Checklist	≥ 8
	Practice cost-effective health care	Practice cost-effective dialysis care	Conferences Core lectures Attending teaching	Checklist 360 evaluation	≥ 8 ≥ 8
	Advocate for quality patient care	Advocate for dialysis patient quality care by demonstrating proactive efforts towards dialysis CQI	Attending teaching Participation in CQI Conferences	Checklist 360 evaluation	≥ 8 ≥ 8