

Home Dialysis Unit Infrastructure

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Question

- How easy or hard is it for you to start a patient on in-center HD? On PD? On HHD?
- What steps do you need to take to actually help your patient decide on a dialysis modality and get dialysis started for your patient?
- And keep them on home dialysis?

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Infrastructure Is the Key to User Friendly Home Dialysis

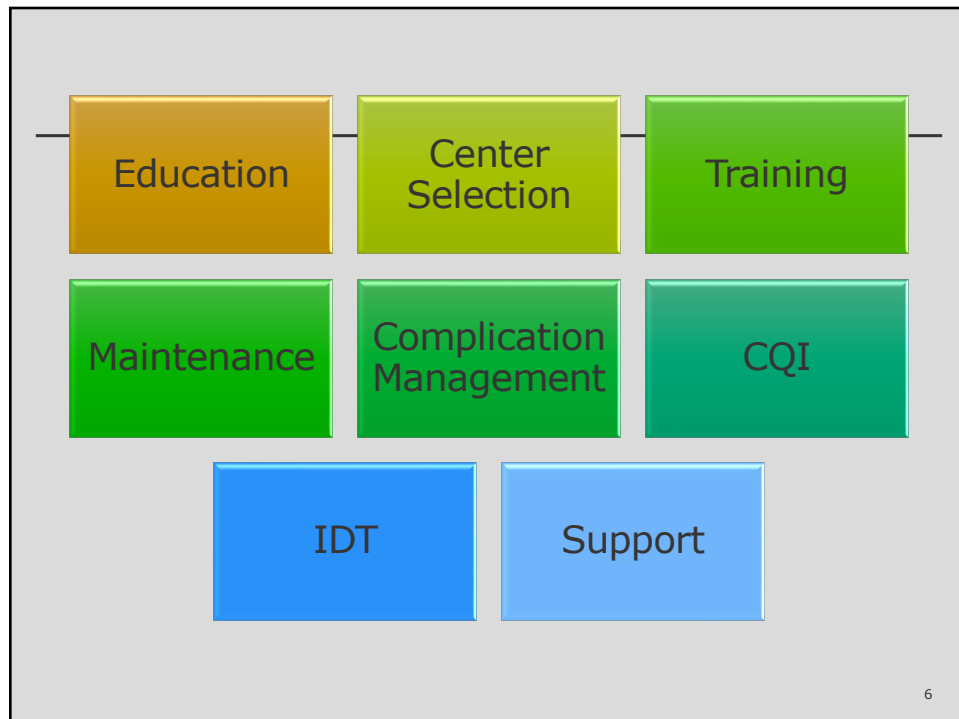
- What do you have to do to start a patient on in-center HD?
- Do you feel more comfortable starting a patient on in-center HD vs. home dialysis
- How easy is it to take care of an in-center HD patient vs. a home dialysis patient?

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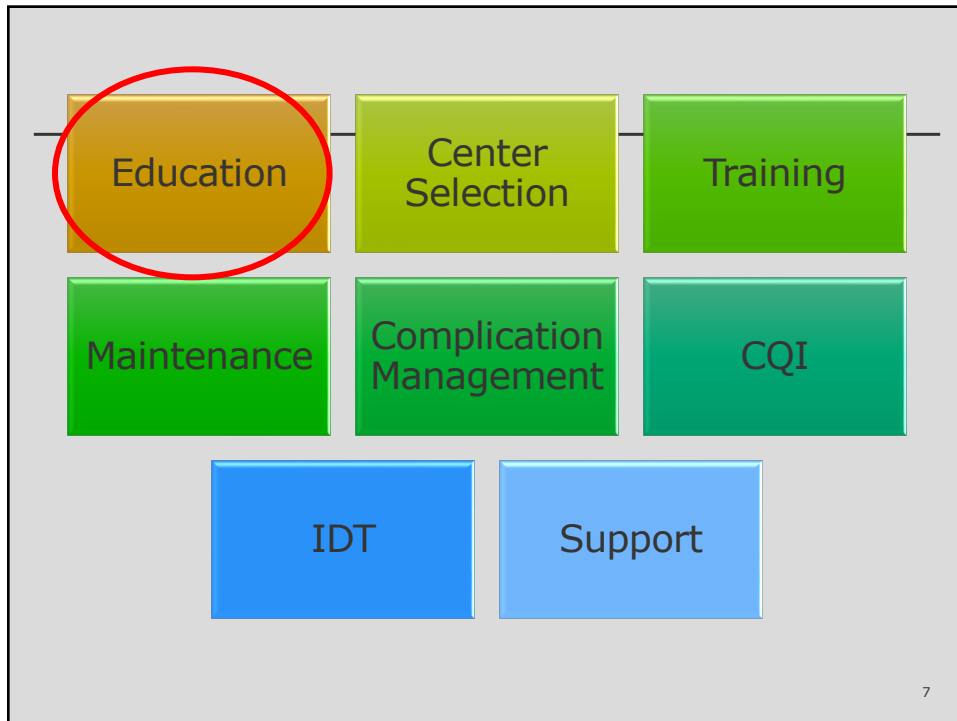
The backstory of a home patient

- Dialysis modality education: where? who? when?
- What are the follow up plans after access placement (where, who, how often)?
- What systems need to be in place for a home unit to be successful?

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Home Dialysis Education – key points

- Timing
- Location
- Educator
- Methods
- Follow-up

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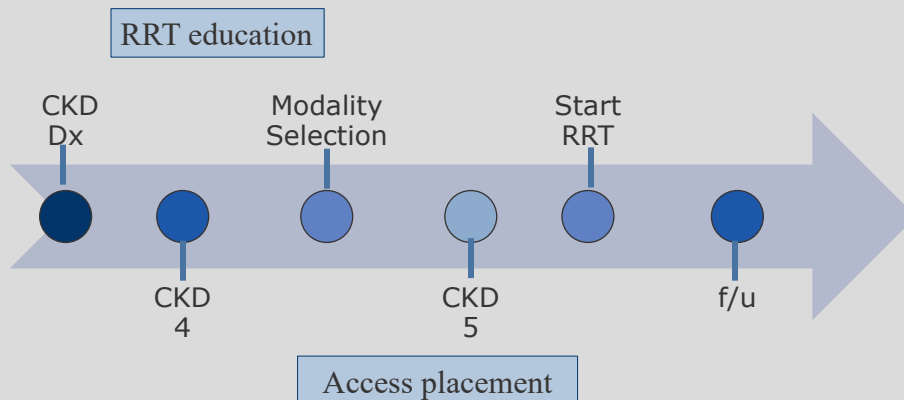
Home Dialysis Education – key points

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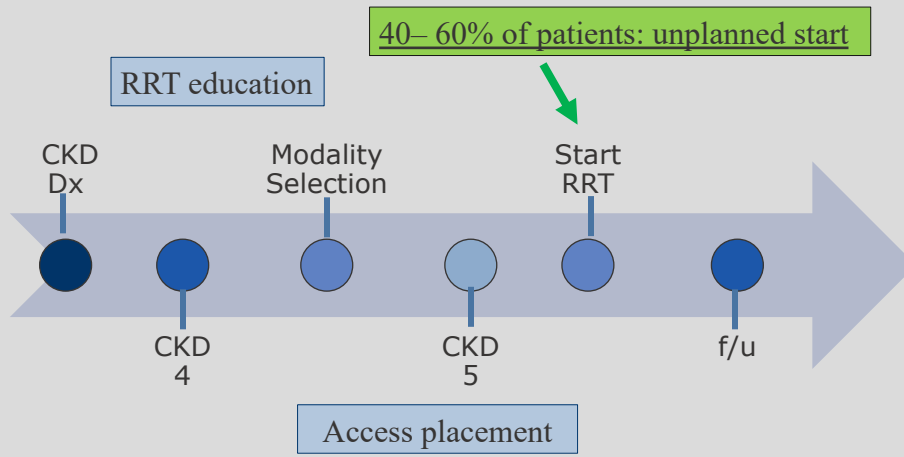
Dialysis timeline



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Dialysis timeline



Mendelssohn DC, et al. *BMC Nephrol.* 2009;10:22. Tennankore KK, et al. *BMC Nephrol.* 2012;13:72. Hassan R, et al. *Can J kidney Heal Dis.* 2019;6

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Home Dialysis Education – key points

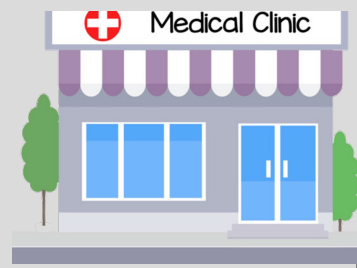
- Timing
- **Location**
- Educator
- Methods
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Home Dialysis Education – key points

- Timing
- **Location**
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- Follow-up



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Home Dialysis Education – key points

- Timing
- Location
- **Educator**
- Methods
- Follow-up

RN
MD
MSW
NP
PA

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Home Dialysis Education – key points

- Timing
- Location
- Educator
- **Methods**
- Follow-up

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Dialysis education: basics

- Provide support and empathy
- Patient centered
- Basic knowledge of kidney function
- Therapy options available
- Discuss benefits, risks, and challenges
- Use of visual and written teaching aids
- Multi-session

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Modality Education: paramount to the success of the home program

- Without education, in-center hemodialysis tends to be the default modality for dialysis patients
- Numerous studies have shown that dialysis education increases patient selection of home dialysis

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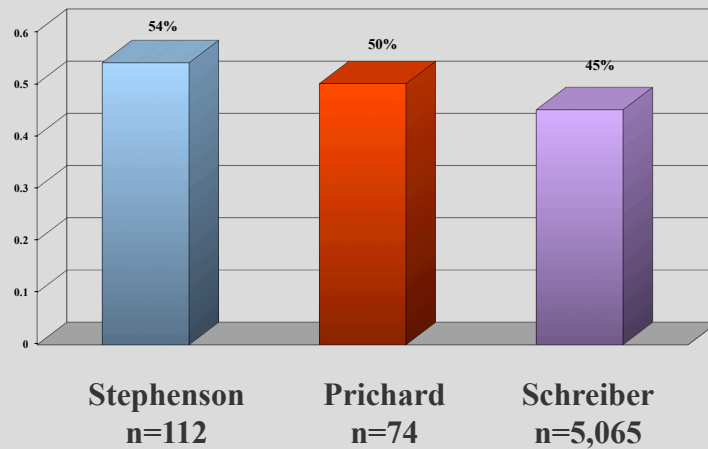
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Dialysis education affects modality choice

Stephenson K et al. Clin J Am Soc Nephrol 6, 2011: 799 - 804

Prichard S. PDI 16, 1996:69-72

Schreiber. NKF Meeting Abstract. April 2000



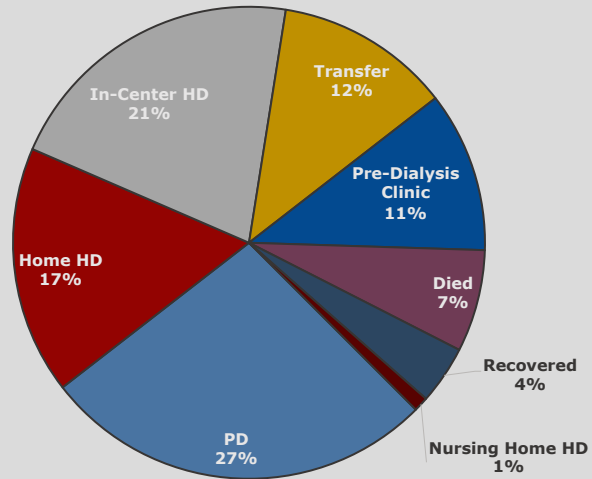
percent of patients choosing PD after an education program

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Education Influences Modality Choice

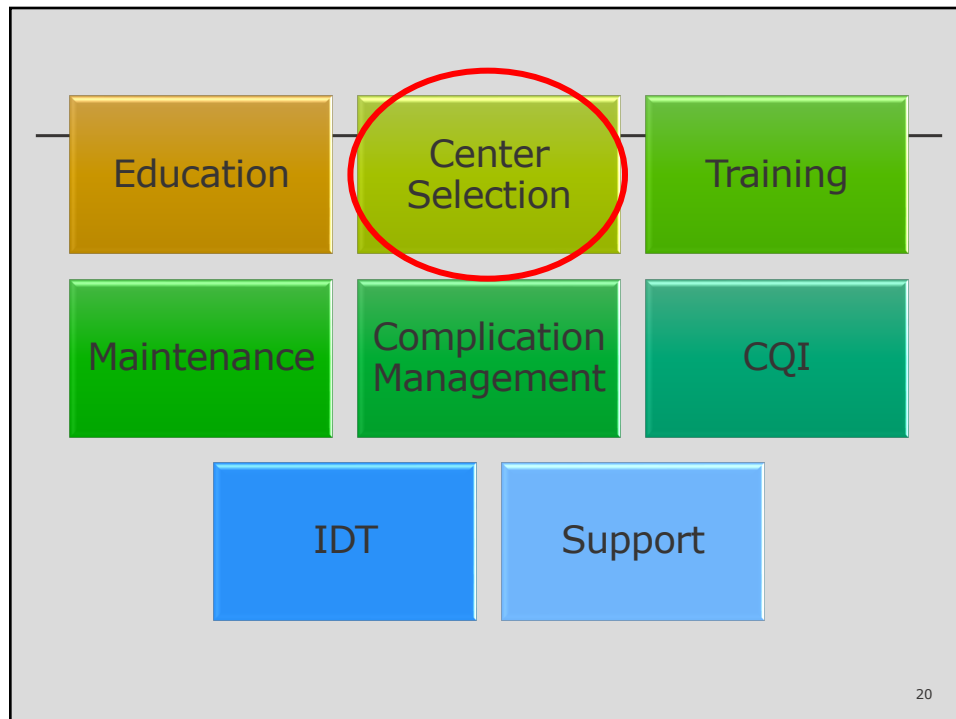
Watson D. *Semin Dial.* 2013;26(2):184-187.

Home dialysis chosen often after in-hospital education



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Home unit facility – physical space

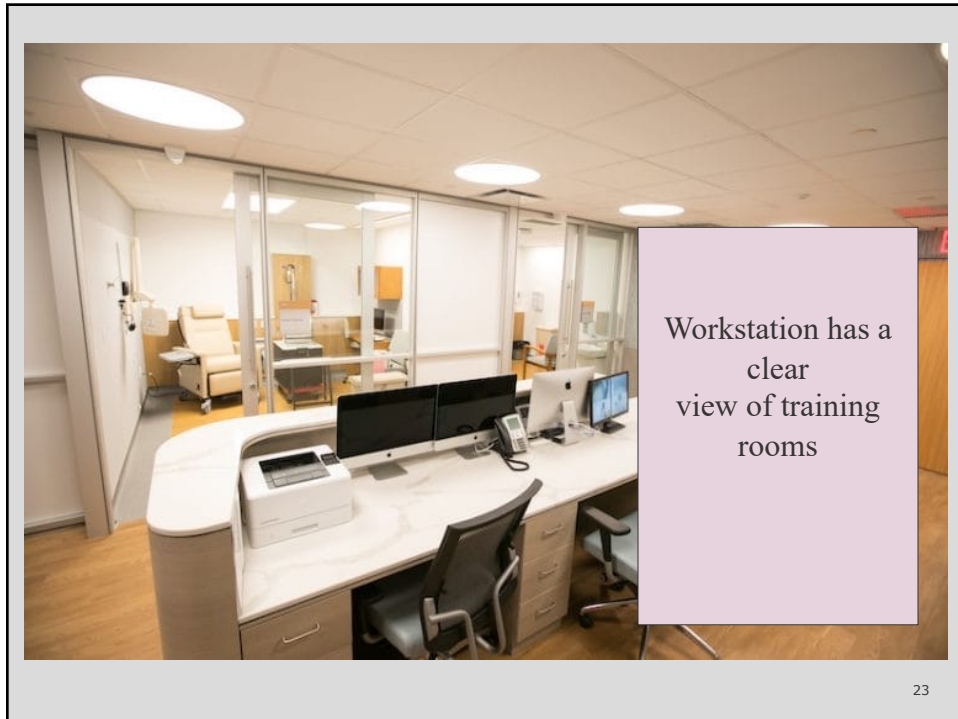
- Training / patient rooms
 - How many ?
- Design / décor
 - Sofas, tables, lamps, posters
 - Sinks / hopper
- Treatment room
 - Extended treatment room
- Visibility

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Center Size Effect: home dialysis

Etheir I *et al.* NDT online 07 February 2020

Htay H *et al.* CJASN 12 (7) 1090-1099, 2017

Center size positively associated with

- increased home dialysis uptake
- lower rate of technique failure
- lower infection rate

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Number of PD patients in a typical US center

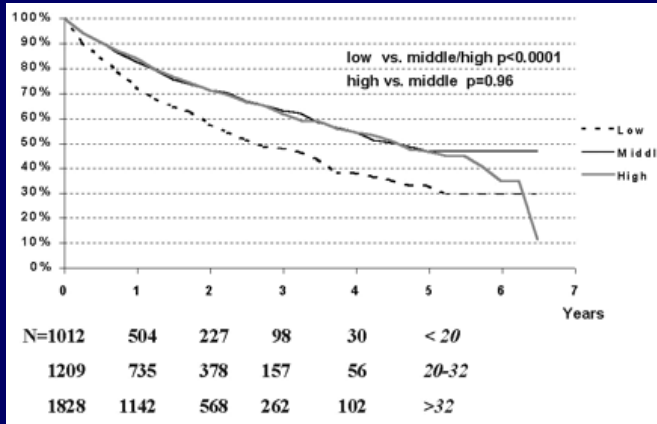
Total # pts	# units	% of total	# pts in group	% of total pts
> 50	59	4.4%	4,158	19.6%
21 - 50	290	21.6%	9,323	44.1%
11 - 20	370	22.8%	4,588	21.7%
6 - 10	249	18.5%	1,938	9.2%
1 - 5	439	32.7%	1,156	5.5%
Total	1,407		36% of patients in units with fewer than 20 patients	

Courtesy of Dr. F. Finkelstein

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Center Size and Technique Failure (Dutch Registry)

Huisman Nephrol Dial Transplant 2002; 17: 1655-1660

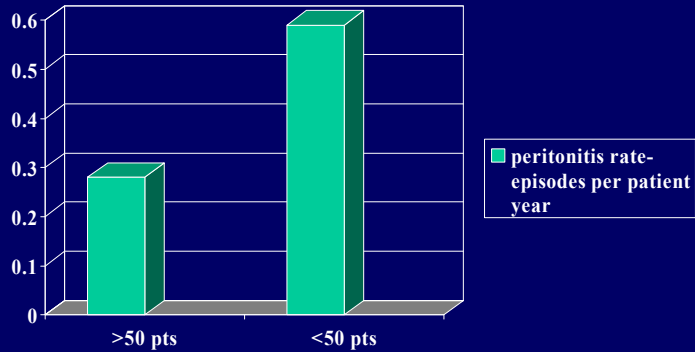


Low: <20 pts, n=1012 Medium 20-32 pts n=1209,
High >32 patients, n=1142

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Peritonitis Rates in Dialysis Units The CHOICE Study

Plantinga L et al Perit Dial Int, 29: 285-291, 2009

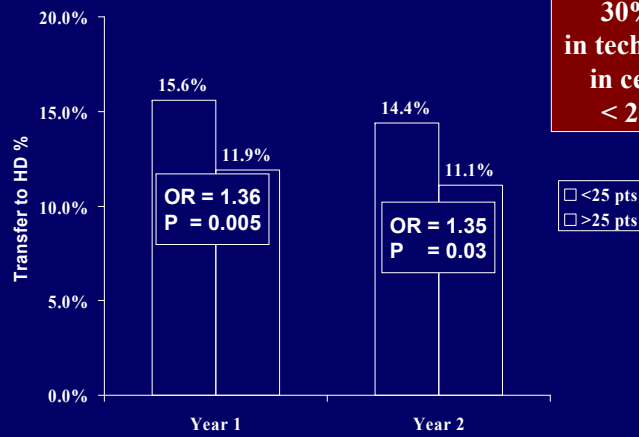


Results are the same when corrected for age, sex, race, comorbidity, BMI, diabetic status

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Technique Failure at 1 and 2 Years in Network 1 (New England) By Center Size (\geq or $<$ 25 patients)

(Afolalu et al: PDI 29:292, 2009)



30% increase in technique failure in centers with < 25 patients

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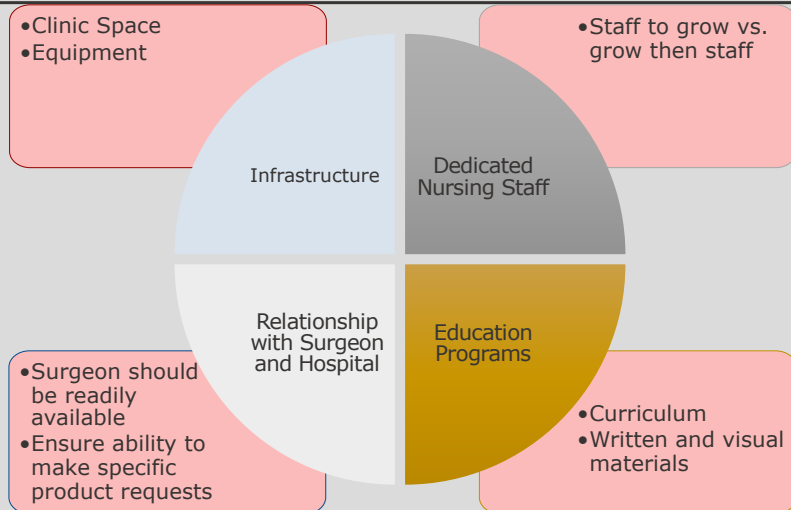
Expanded Home Dialysis

- Urgent-start
- Transitional Care
- Assisted PD

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Developing an Urgent Start PD Program



Casaretto A, et al. *Adv Perit Dial.* 2012;28:102-105
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Transitional Care Units

- acute-start dialysis patients can receive dialysis and train on home dialysis in the same location
- avoids in-center HD
- concentrates on patient education and treatment for the first 30-60 days of dialysis
- dedication RN(s) and PCT(s)
- up to 4+ weeks of in-depth home modality education, support for decision making

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Transitional Start Unit: UVA-Charlottesville



*Debbie Cote, MSN, RN, CNN, NE-BC, is the Dialysis Program Administrator for the University of Virginia

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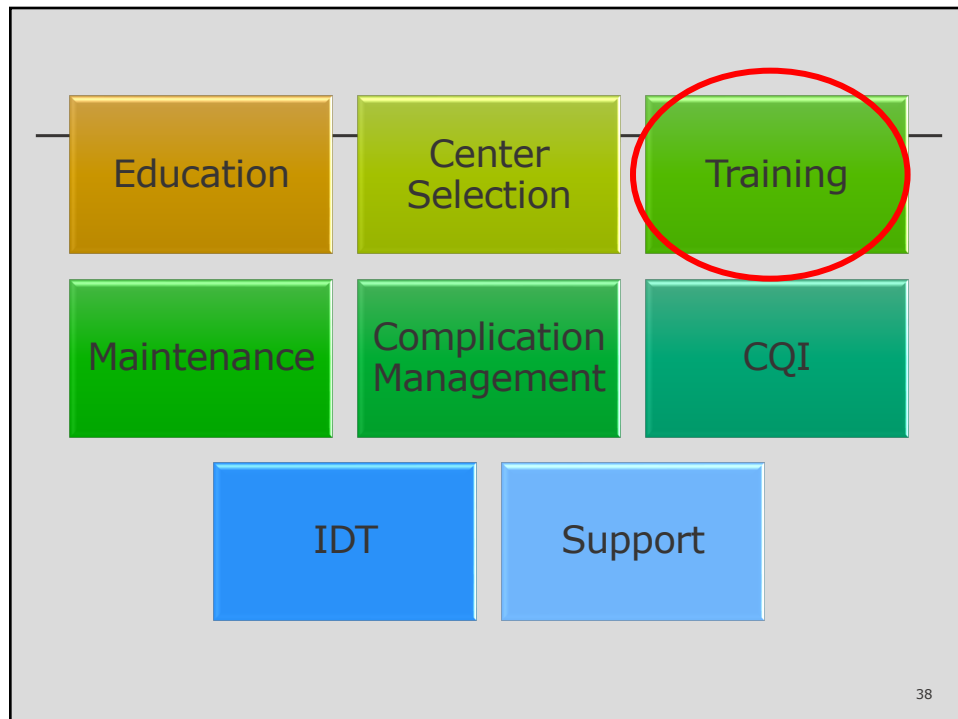
Nurses in the home unit

- Dedicated to the therapy
- Independent
- Competent, trustworthy
- Well trained

- The best home RNs are the best teachers/trainers.

- Bernardini et al. reports on various aspects of nursing care in PD:
PDI 26:658, 2006

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Profile of a Successful Home Dialysis Nurse

Gokal et al Textbook of Peritoneal Dialysis, 2000; Ch 10; pp 363-386

- Believes strongly that patients are capable of caring for themselves
- Comfortable in a self-directed, autonomous role
- Enjoys teaching and understands the principles of adult learning
- Process oriented as opposed to task oriented
- Understands that the process of problem solving may not provide immediate results and stays with the process through resolution
- Sufficient experience to become expert at assessing the subtleties of the complications associated with peritoneal dialysis
- Confident and assertive in physician relationships and interactions
- Enthusiastically promotes the quality and advantages of home dialysis

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Suggested RN: patient ratios (PD)

The Renal Association (UK) 1:20

British Renal Society 1:20

ESRD networks (regional) \leq 1:25

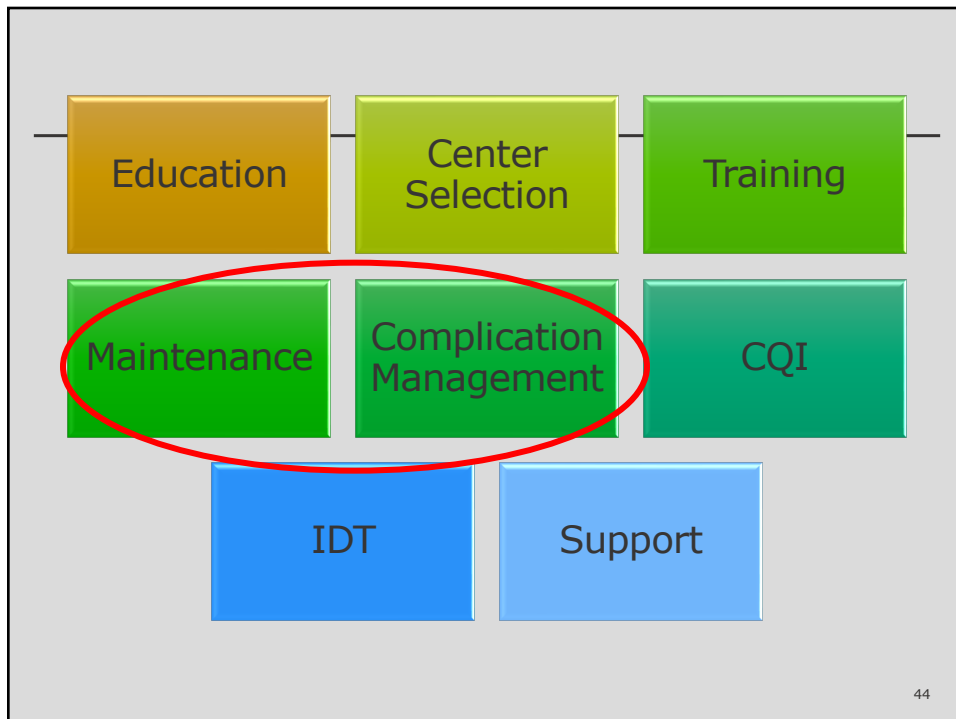
Kaiser - Southern California 1:15

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Regional home dialysis training centers?

- Cost effective
 - Initial infrastructure investment spread out over many more patients
- Efficient
- Better outcomes
 - (larger centers with more experience have better outcomes)
 - RNs get more experience more often
- Might reduce impact of experienced RN shortage

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Standardized vs. individualized orders

Dialyzer: _____
EDW: _____ kg
Lactate: 40 mEq/L 45 mEq/L
Volume: 25 L 30 L 35 L
Frequency of Dialysis: _____ x/week
Flow Fraction: _____ %
Blood Flow Rate: _____ ml/minute

- Short Daily prescription based on dosing calculator and reviewed with MD & Medical Director
- Candidate for Nocturnal Dialysis based on dosing calculator

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Standardized processes

- phone calls: who, when?
- supply ordering: who, when?
- labs: when/where?
- how many visits/month, where, how, and with whom?

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Standardized processes

- phone calls: who, when?
- supply ordering: who, when?
- labs: when/where?
- how many visits/month, where, how, and with whom?
- **Protocols**
 - Anemia
 - (get it from unit, pharmacy?)
 - Administer in unit, home?
 - Volume overload, HTN
 - Vitamin D
 - Catheter malfunction
 - Peritonitis, ESI
 - PET , adequacy

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Protocols for a home unit: general

- Vaccinations and HBV testing
- Anemia (ESA, Iron)
- Vitamin D
- 24h collections for adequacy testing
- Holiday dialysis
- Discharge to home
- Machine set-up
- Disaster preparedness

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Protocols: Home HD

- Home administration of ESA
- Water safety testing
- Access care and venipuncture
- Catheter care, catheter access
- Heparin
- Clotted dialyzer
- Managing complications
 - Accidental disconnect
 - Infection, fever

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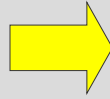
Protocols: PD

- Anemia (ESA, Iron)
- Vitamin D
- PET (2.5% vs. 4.25%)
- 24h collections for adequacy testing
- Exit site care
- Transfer set change procedure
- Administration of IP medications
- Teaching home ESA and IP medication administration
- Contamination procedure
- Managing complications
 - Peritonitis, ESI, poor outflow, etc

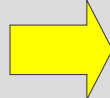
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Pivotal to Home Dialysis Nurse Success: Understand Physician Expectations

Prior to calling MD

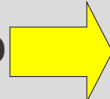


Exhaust nursing scope of practice and follow pertinent policies, protocols and standing orders

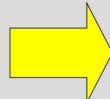


Be prepared to describe the patient problem, results of nursing assessment and any pertinent labs

While speaking w/ MD



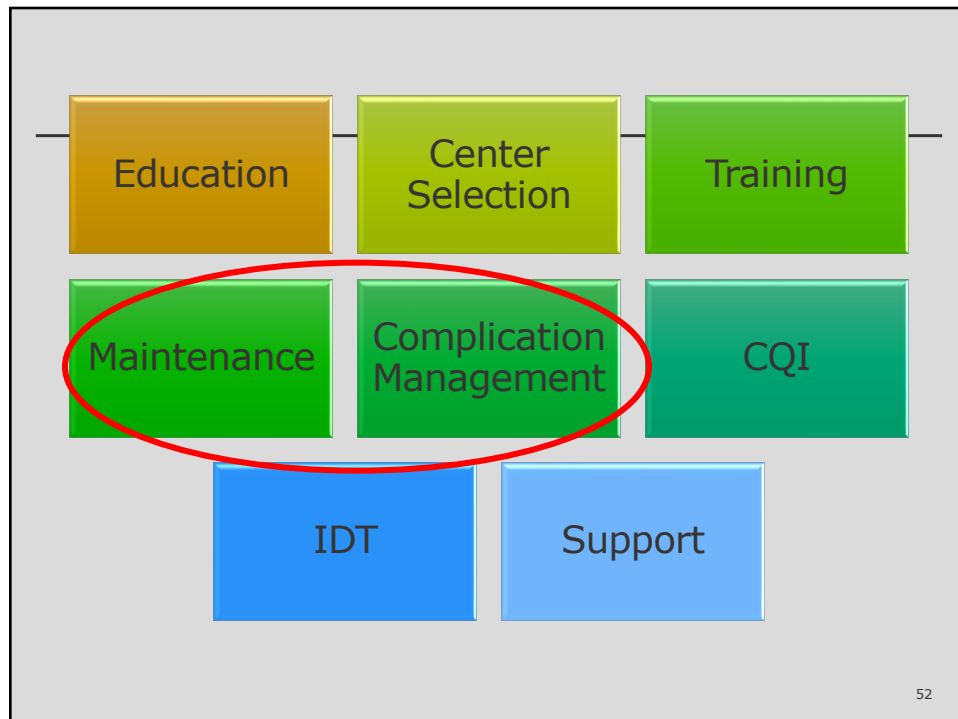
Describe steps taken to resolve the problem including patient response to interventions



Have a plan, discuss next steps and ask for a physician order if needed

Courtesy of Drs. Burkart and Golper

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QAPI: Quality Assurance & Performance Improvement

- QAPI involves the entire care team continually reviewing the overall care provided in the dialysis center and seeking ways to improve on the systems and clinical processes as opposed to individual problems as they arise.
- The dialysis facility must develop, implement, maintain, and evaluate an effective, data-driven, quality assessment and performance improvement program with participation by the professional members of the interdisciplinary team. *

*494.110 Condition: quality assessment and performance improvement process definition by conditions for coverage and metrics; CMS, Centers for Medicare & Medicaid Services

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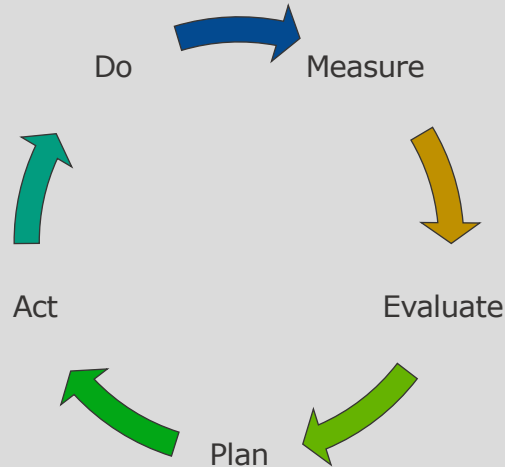
QAPI

- adequacy of dialysis
- nutritional status
- mineral metabolism and renal bone disease
- anemia management
- dialysis access
- medical injuries and medical error identification
- patient satisfaction
- infection control

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QAPI / CQI



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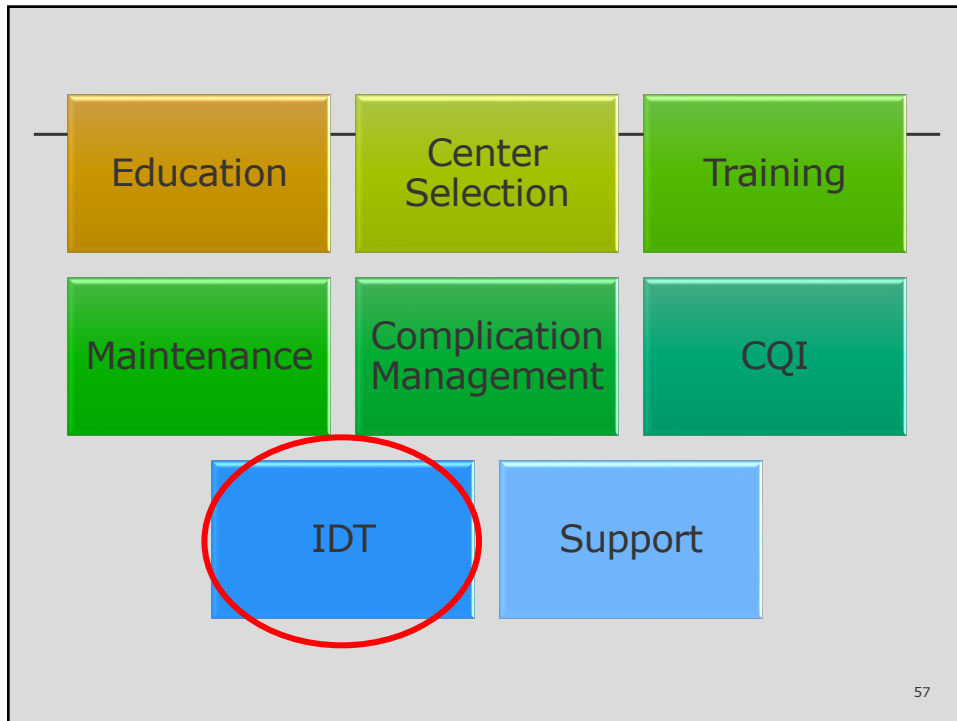
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Dialysis QAPI

- Include the interdisciplinary care team (IDT), Medical Director, and when possible include the patient voice
- Be data-driven and incorporate indicators related to improved medical outcomes and reduction of medical errors
- Aggregate data to allow for tracking, trending, and performance evaluation both clinically and operationally
- Involve continuous monitoring, evaluation, and adjustment to meet changing facility needs
- Include a clear statement of the purpose of the improvement, goals, estimated time to attainment, and priority within the system

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RD roles

- performs dietary assessment
- education – initial and ongoing
 - sodium, potassium, phosphorus
- Monitors and advises patients, and liaises with MD re:
 - albumin levels, protein intake
 - calcium, phosphorus, PTH levels, and CKD-MBD medication adherence
 - potassium balance
 - fluid balance

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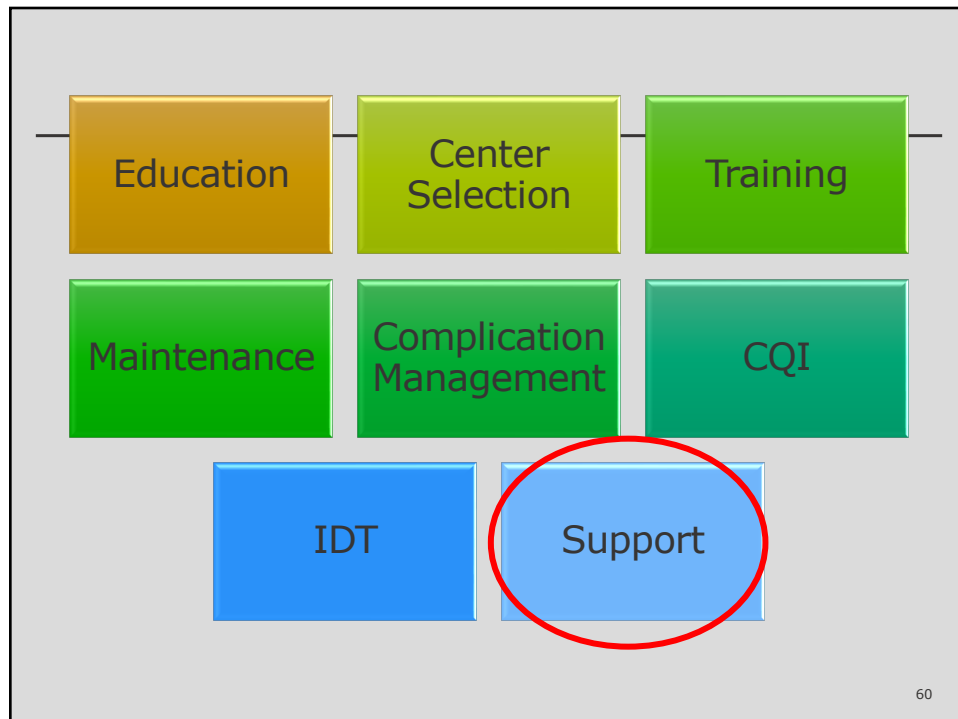
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MSW roles

- initial PD education / assessment team member
- assess psychosocial factors that might affect care
- assess caregiver status
- provide patient/family support and assess for possible areas of psychosocial intervention, *e.g.* clinical depression, grief after loss,
- function as a liaison between the medical care team and the patient and family system

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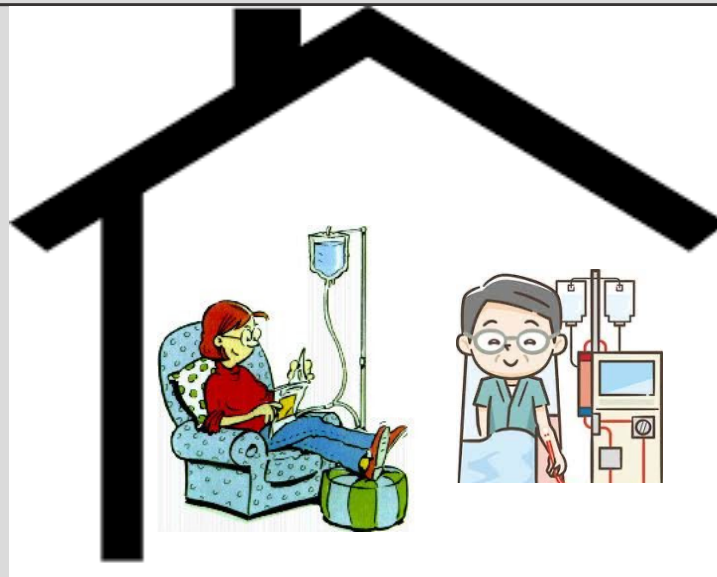
Home dialysis unit: physician support

- EMR
- Ordering platforms
- Telehealth
- Tracking tools, CQI reports
- Physician education
- Patient outreach

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The Goal:



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