



**Derbyshire Support &
Facilities Services Limited**



**University Hospitals of
Derby and Burton**
NHS Foundation Trust

A Patient Perspective: Living with Chronic Kidney Disease and Home Haemodialysis Dialysis

Ian Hazel - Director of ICT and Infrastructure

Chesterfield Royal Hospital NHS Foundation Trust & Derbyshire Support and Facilities Services Limited

Carol Rhodes - Senior Sister, Home Dialysis Team

University Hospitals of Derby and Burton NHS Foundation Trust



**Chesterfield
Royal Hospital**
NHS Foundation Trust

WHY ARE THE KIDNEYS SO IMPORTANT

The kidneys are powerful chemical factories that perform the following functions:

- remove waste products from the body
- remove drugs from the body
- balance the body's fluids
- release hormones that regulate blood pressure
- produce an active form of vitamin D that promotes strong, healthy bones
- control the production of red blood cells

WHAT HAPPENS WHEN THE KIDNEYS FAIL

Chronic Kidney Disease (CKD):

- High blood pressure.
- Blood and/or protein in the urine.
- More frequent urination, particularly at night; difficult or painful urination.
- Puffiness around eyes, swelling of hands and feet.
- A creatinine and Blood Urea Nitrogen (BUN) blood test, outside the normal range. Urea, Nitrogen and Creatinine are some of the waste products that build up in your blood when your kidney function is reduced.
- A reduced estimated glomerular filtration rate (eGFR). eGFR is a measure of kidney function.

WHAT ARE THE STAGES OF CKD?

CKD is divided into 5 stages:

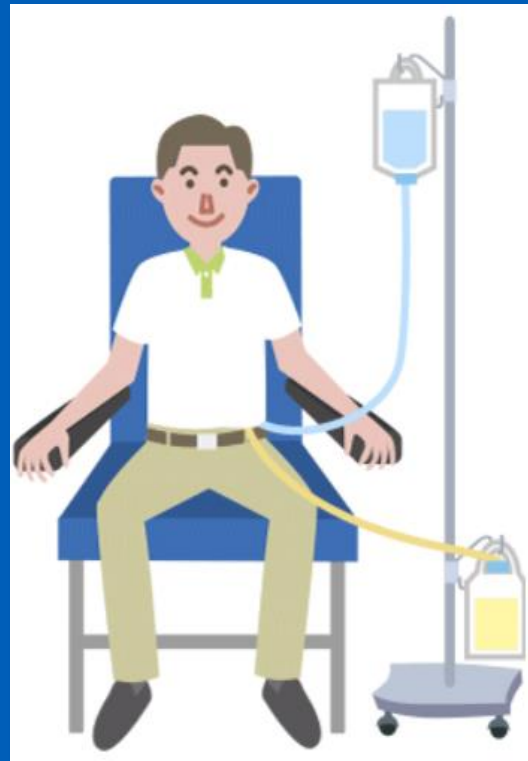
- **Stage 1** is eGFR greater than 90 ml/min, which is normal but there are some signs of kidney damage on other tests (e.g. Blood or protein leak in urine, multiple cysts in the kidneys, single kidney).
- **Stage 2** is eGFR 60-90 This is mildly decreased with some sign of kidney damage on other tests
- **Stage 3a** is eGFR 45-59 ml/min, a mild to moderate reduction in kidney function
- **Stage 3b** is eGFR 30-44 ml/min, a moderate to severe reduction in kidney function
- **Stage 4** is eGFR 15-29 ml/min, a severe reduction in kidney function. You may need additional medications to support loss of certain functions of the kidneys.
- **Stage 5** is eGFR less than 15 ml/min, established kidney failure. Very likely to experience symptoms of kidney failure, when dialysis or a kidney transplant may be needed.

TREATMENT OPTIONS FOR CKD STAGE 5

Haemodialysis



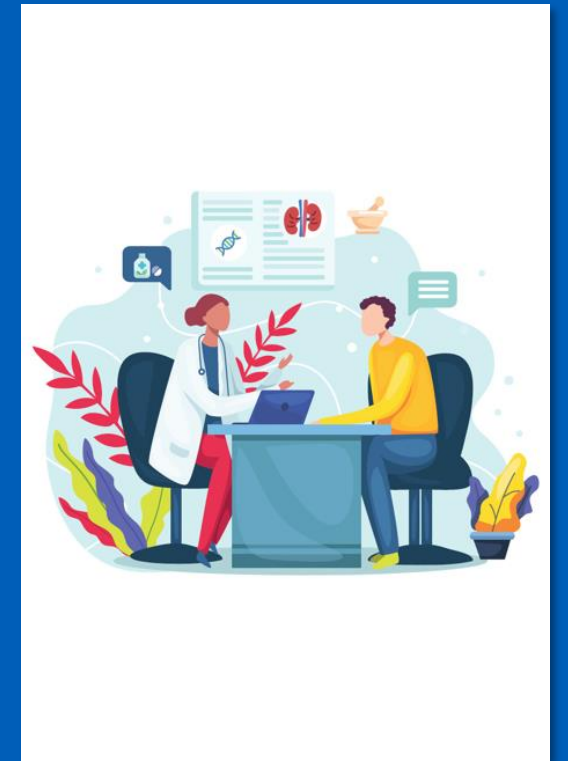
Peritoneal Dialysis



Transplant

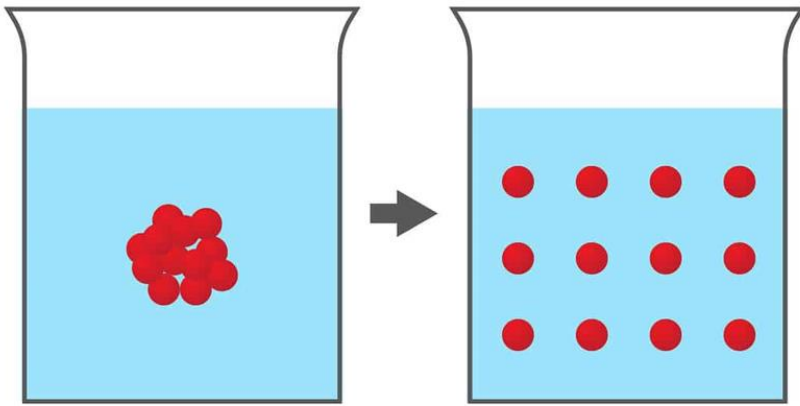


Conservative Care



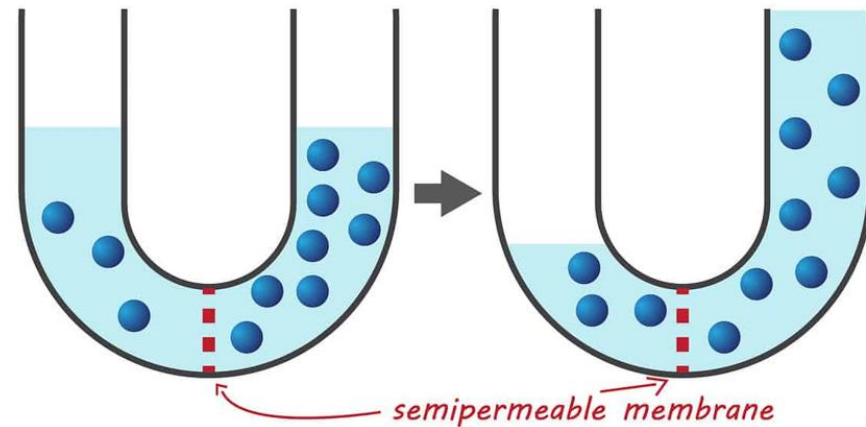
HOW DOES DIALYSIS WORK

Diffusion



SOLUTE move from
HIGH → **LOW**
concentration

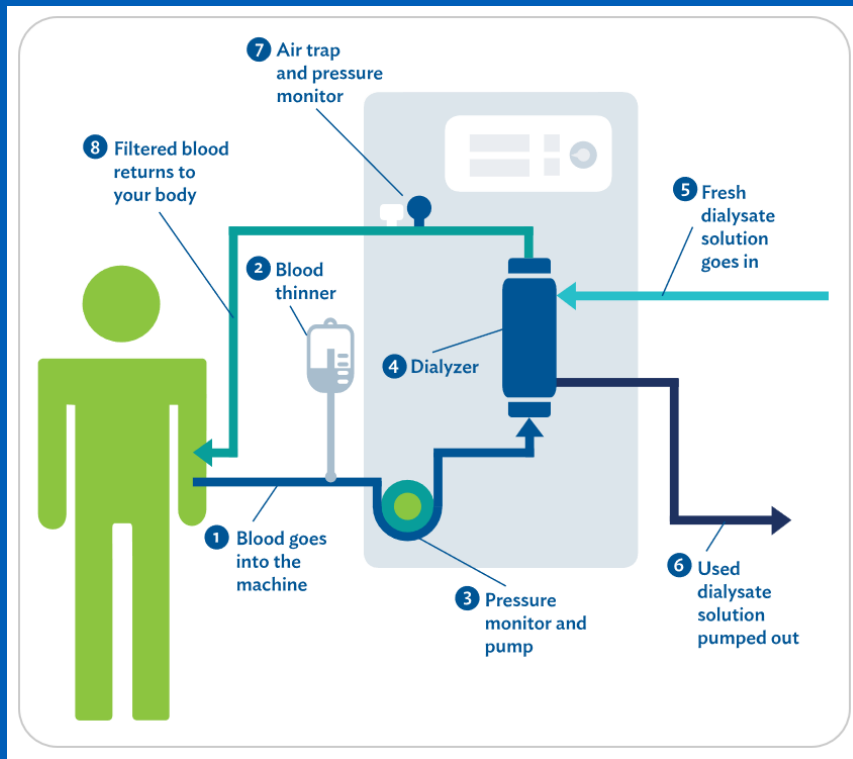
Osmosis



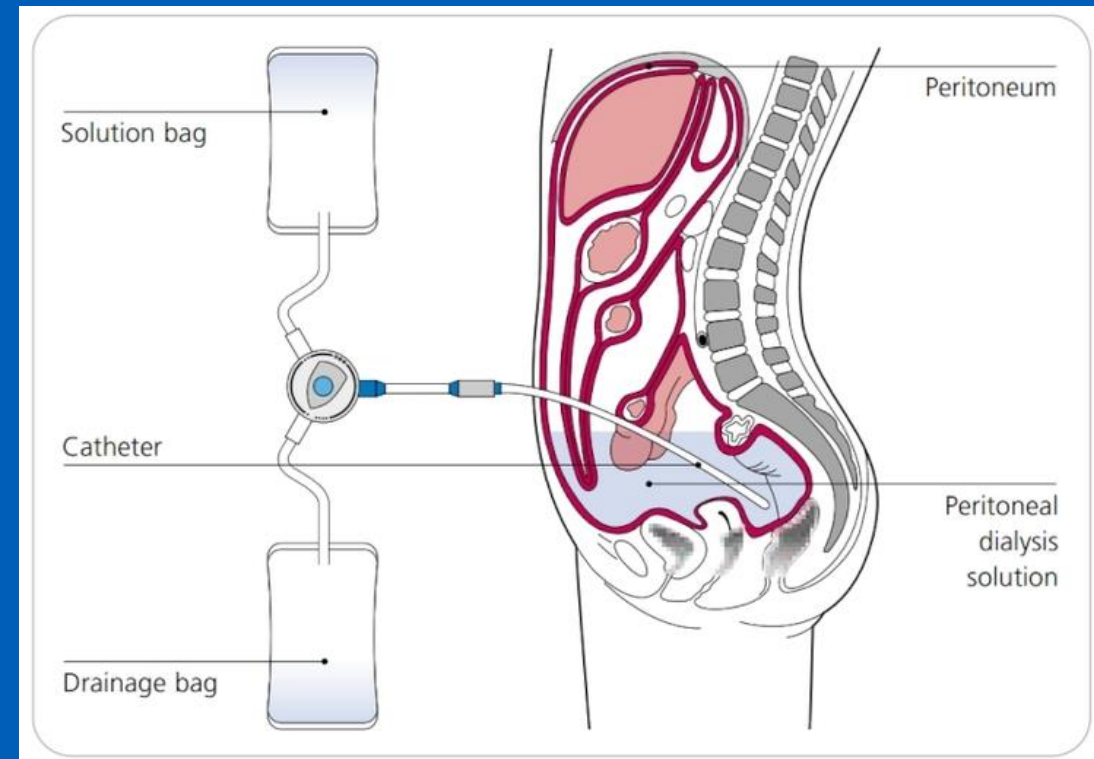
SOLVENT (WATER) move from
LOW → **HIGH**
concentration

HOW DOES DIALYSIS WORK

Haemodialysis



Continuous Ambulatory Peritoneal Dialysis



MY DIAGNOSIS

Cryoglobulinaemic
Membranoproliferative
Glomerulonephritis with
Dense Deposits



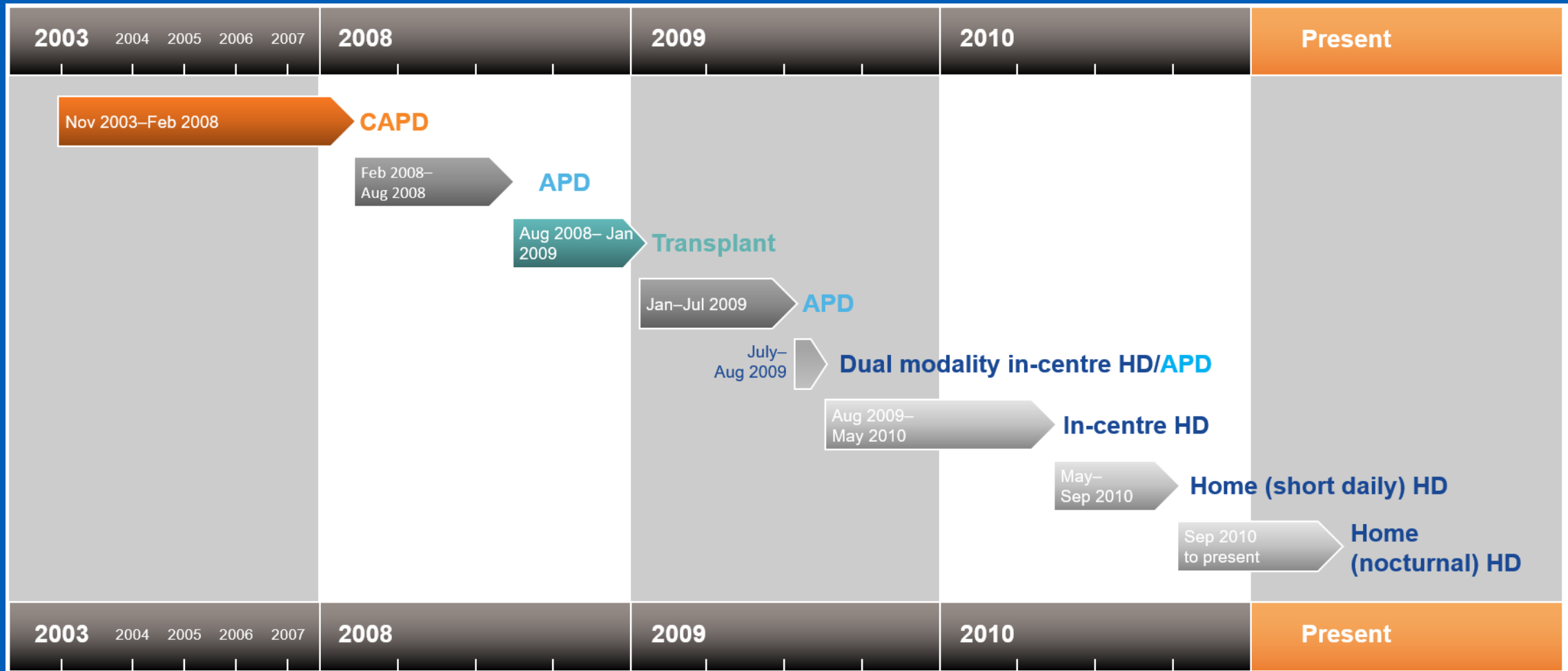
STARTING DIALYSIS

Choosing my
treatment



Progressed to
end stage renal failure
in October 2003

MY THERAPY JOURNEY



LIVING MY 'BEST LIFE'

Home, high-dose, nocturnal haemodialysis

For me positive,
positive, positive...



No phosphate
binders or anti-
hypertensive
medication



Free of dietary and
fluid restrictions



General well-being
and physical health
massively improved



Dialysis sessions
complication free
and no post-dialysis
fatigue



Limited impact on
day-to-day life



Maintained full-time
employment in
senior roles for full
20 years of
treatment



**My modality
and treatment
method of
choice**

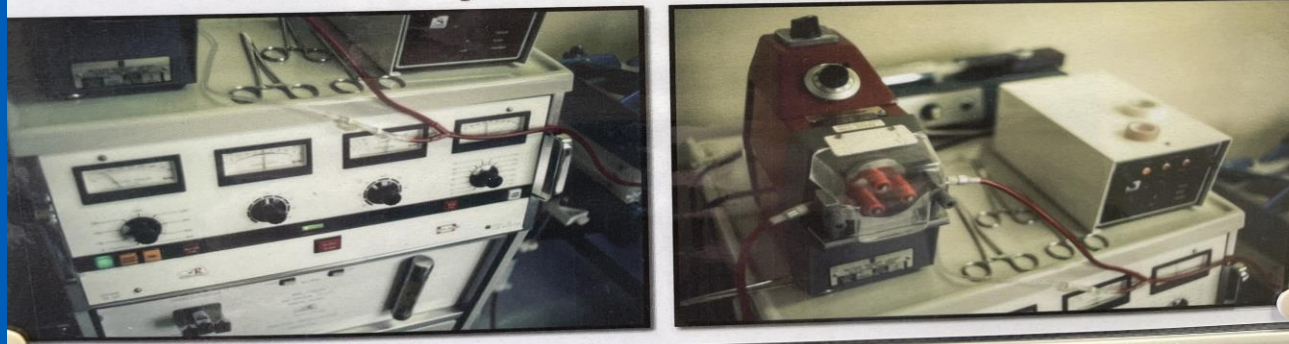


DERBY HAEMODIALYSIS BACKGROUND

- Derby Dialysis Unit opened in 1970 and looked like this
- 9 stations



Derby's First Renal Unit



- Today's current unit with 55 stations
- We treat 270+ patients a week, over 3 shifts



HOME HAEMODIALYSIS BACKGROUND

- In 1990's Home HD looked like this
- 4 patients at home



- Today's Home HD equipment is compact and transportable
- Over 60 patients at home to currently



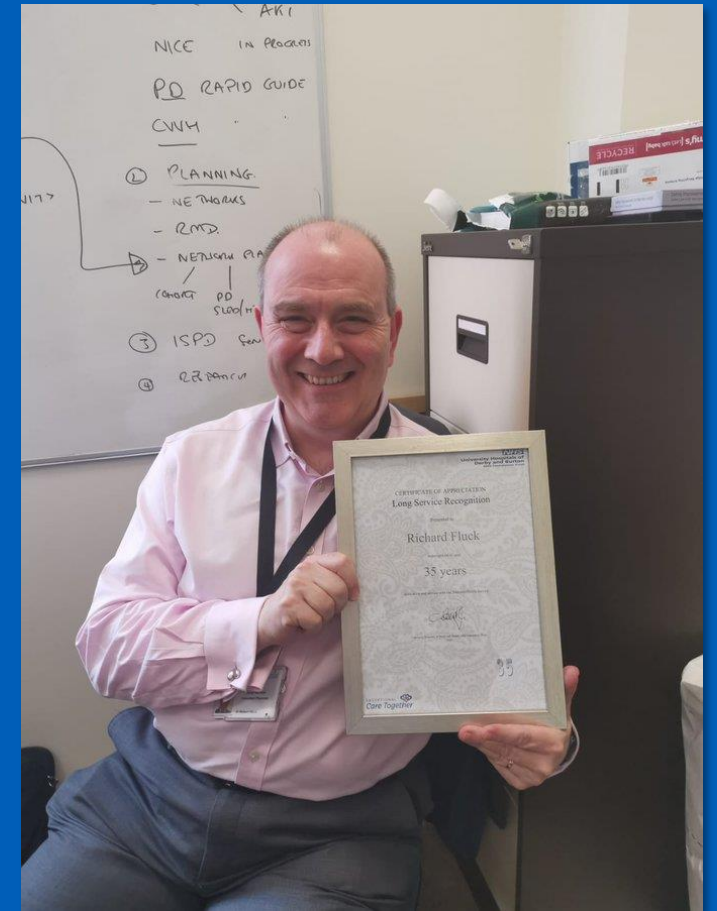
INNOVATION & DEVELOPMENT

- Machines and technology evolved



DERBY HOME HAEMODIALYSIS TEAM

- Clinical Lead
- 1 x band 7
- 2 x band 6
- 1 x band 4

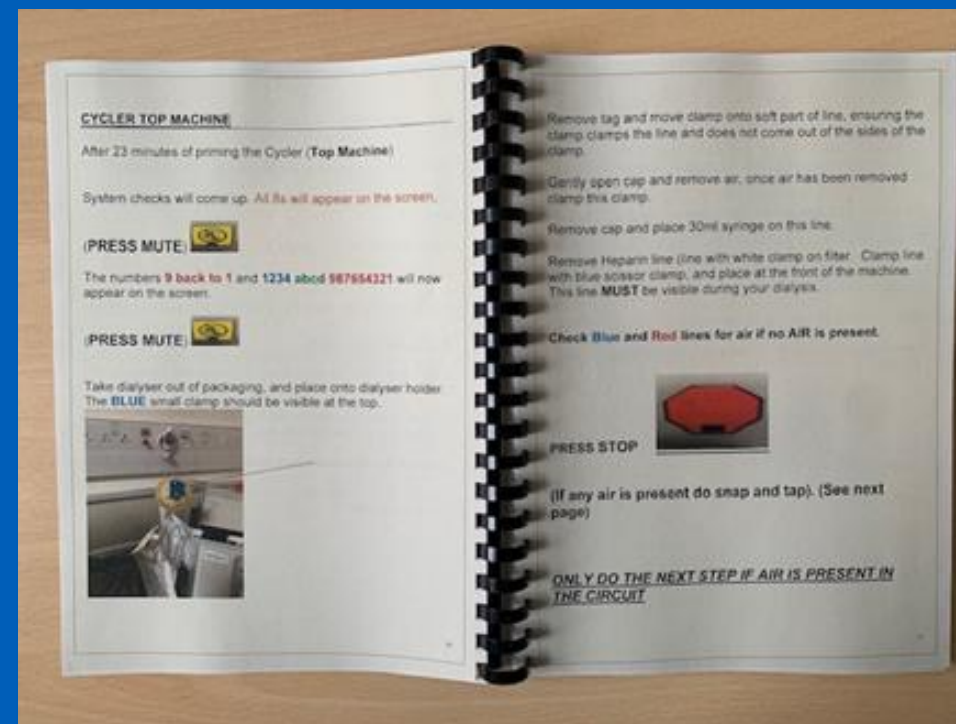
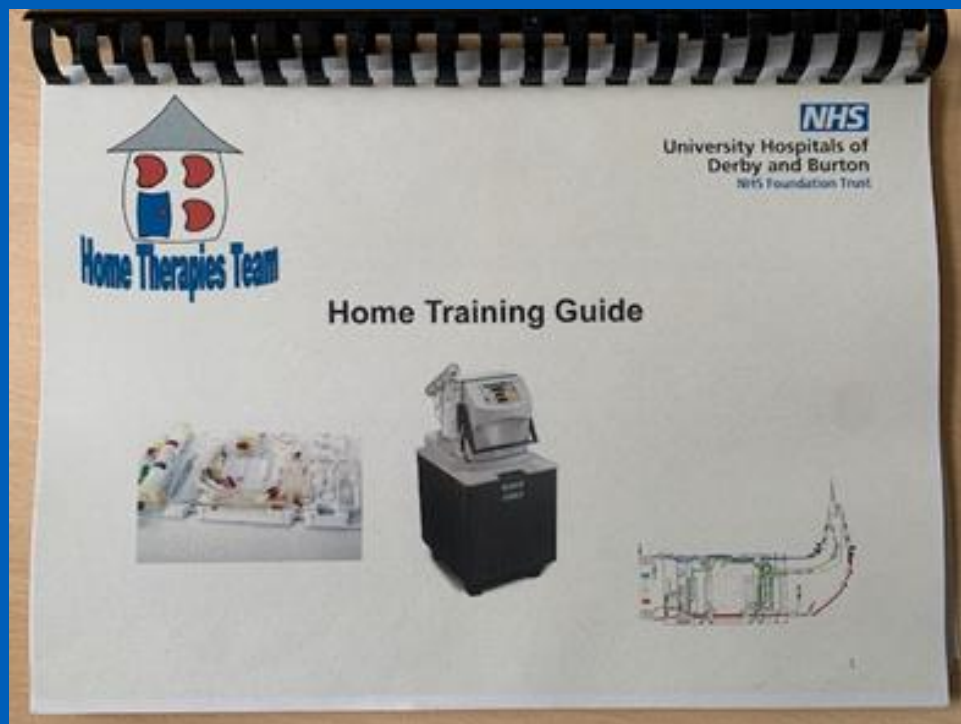


ISSUES

1. How do we monitor increasing number of patients with minimal staffing?
2. Reduce paper/ transcribing dialysis sessions onto Renal IT systems.
This can be unreliable, inaccurate, delayed and cumbersome for patients and staff, and can delay response to clinical issues that might arise, with a potential impact on outcomes.
3. Deliver patient training in a more efficient way

LOTS OF PAPER!

- Dialysis Sheets
- Training guides/manuals



NEW TECHNOLOGY/REMOTE MONITORING

- Nx2me Connected Health connects clinicians with their home haemodialysis patients, enabling timely exchange of health information and improving the patient experience.
- It's an iPad-based platform.
- It collects NxStage cyclor data in treatment as well as patient specific data such as blood pressure and weight.
- The system transmits the data to the health care teams following each session, enabling the team to review the data in the Nx2me clinical portal, a web-based platform.

NXSTAGE NX2ME CONNECTED HEALTH



NXSTAGE NX2ME CONNECTED HEALTH

The Nx2me App is designed to help:

- Monitor and support patient adherence and potentially reduce complications
- Reduce patient burden and enhance patient confidence
- Increase patient retention through compliance monitoring and enhanced connection with patients
- Reduce effort involved in collecting flowsheets

NXSTAGE NX2ME CONNECTED HEALTH



NXSTAGE NX2ME CONNECTED HEALTH

NXSTAGE Southern Derbyshire Acute Hospital : D03HP
 User: Christopher Swan | Help | Tools v | Logout

DASHBOARD PATIENTS TREATMENTS NEW MESSAGES EQUIPMENT

Flowsheet Status

- 33 New
- 0 Pending
- 0 Call Patient

Flowsheet Statistics

- 6 Flowsheets with ≥ 3 alerts
- 22 Flowsheets with 1 - 2 alerts
- 3 Unconfirmed flowsheets


Patients

- 6 Inactive
- 2 Need Settings defined
- 2 Need Alert Criteria defined

Flowsheet Summary Start Date: 8/23/2018 End Date: 8/25/2018 [View](#)

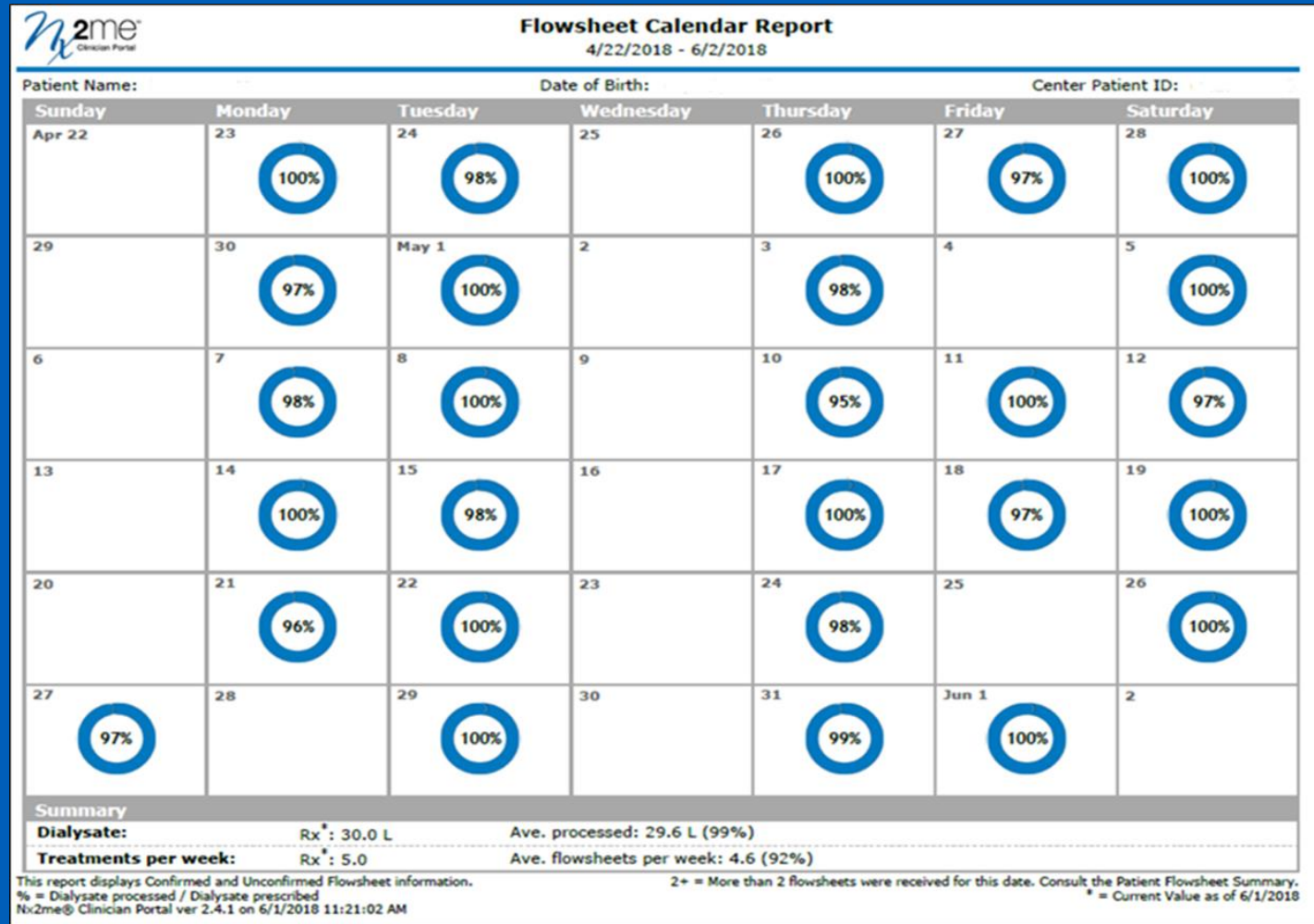
	Alerts	Treatment Date	Patient Name	Date of Birth	Center Patient ID	Flowsheet Status	Treatment Notes	Treatment Duration	Dialysate (Processed/Rx)	Ultrafiltration	Weight (Post/Dry-Rx)	Print
<input type="checkbox"/>	1	8/25/2018				New		200 min	50.0 / 50.0 L	1.2 L	115.5 / 115.5 kg	
<input type="checkbox"/>	1	8/24/2018				New		210 min	60.0 / 60.0 L	2.8 L	112.4 / 111.0 kg	
<input type="checkbox"/>		8/24/2018				New		180 min	30.0 / 30.0 L	0.5 L	77.2 / 77.5 kg	
<input type="checkbox"/>	4	8/24/2018				New		186 min	30.0 / 30.0 L	1.5 L	110.0 / 109.5 kg	
<input type="checkbox"/>	1	8/24/2018				New		180 min	30.0 / 30.0 L	1.4 L	61.0 / 61.5 kg	
<input type="checkbox"/>	1	8/24/2018				New		180 min	30.0 / 30.0 L	1.3 L	64.2 / 64.0 kg	
<input type="checkbox"/>	1	8/24/2018				New		180 min	30.0 / 30.0 L	0.7 L	70.4 / 68.5 kg	
<input type="checkbox"/>	1	8/24/2018				New		202 min	60.0 / 60.0 L	2.2 L	125.1 / 125.5 kg	
<input type="checkbox"/>	3	8/24/2018				New		181 min	39.6 / 40.0 L	1.0 L	- / 80.0 kg	
<input type="checkbox"/>	2	8/24/2018				New		180 min	40.0 / 40.0 L	1.7 L	102.8 / 102.5 kg	
<input type="checkbox"/>	3	8/24/2018				New		0 min	0.0 / 30.0 L	0.0 L	- / 94.0 kg	

NXSTAGE NX2ME CONNECTED HEALTH

		Flowsheet Summary Report 4/10/2018 - 5/10/2018									
Patient Name:										Number of treatments per week*: 5.0	
Date of Birth:		Center Patient ID:				Patient Access Type*: Fistula					
Treatment Date	Treatment Duration (min)	Dialysate (L) (Processed/Rx)	UF (L)	Weight (Kg) (Post/Dry-Rx)	Pre-Tx Sitting BP (Sys/Dia)	Pre-Tx Standing BP (Sys/Dia)	Post-Tx Sitting BP (Sys/Dia)	Post-Tx Standing BP (Sys/Dia)	VP@200 BFR (mmHg)	Saline Bolus (ml)	
5/9/2018	180	30.0 / 30.0	0.8	68.0 / 68.5	118 / 76	- / -	107 / 71	- / -	110	-	
5/8/2018	180	30.0 / 30.0	0.8	68.3 / 70.5	118 / 77	- / -	117 / 76	- / -	127	-	
5/7/2018	180	30.0 / 30.0	0.8	68.4 / 70.5	120 / 77	- / -	112 / 71	- / -	102	-	
5/5/2018	180	30.0 / 30.0	0.8	68.6 / 70.5	121 / 78	- / -	118 / 77	- / -	120	-	
5/2/2018	180	30.0 / 30.0	0.5	68.4 / 70.5	124 / 79	- / -	131 / 84	- / -	122	-	
5/1/2018	180	30.0 / 30.0	0.5	68.7 / 70.5	115 / 71	- / -	126 / 82	- / -	126	-	
4/30/2018	180	30.0 / 30.0	0.5	68.6 / 70.5	- / -	117 / 79	125 / 82	- / -	116	-	
4/28/2018	180	30.0 / 30.0	0.5	68.8 / 70.5	120 / 78	- / -	129 / 85	- / -	122	-	
4/27/2018	180	30.0 / 30.0	0.5	69.1 / 70.5	126 / 84	- / -	122 / 83	- / -	138	-	
4/25/2018	180	30.0 / 30.0	0.5	69.2 / 70.5	124 / 76	- / -	133 / 84	- / -	118	-	
4/24/2018	180	30.0 / 30.0	0.7	70.2 / 70.5	126 / 90	- / -	124 / 80	- / -	133	-	
4/23/2018	180	30.0 / 30.0	0.8	70.3 / 70.5	126 / 80	- / -	120 / 79	- / -	116	-	
4/21/2018	180	30.0 / 30.0	0.5	70.5 / 70.5	110 / 71	- / -	119 / 71	- / -	119	-	
4/20/2018	163	27.1 / 30.0	0.7	70.5 / 70.5	116 / 72	- / -	112 / 71	- / -	122	-	
4/18/2018	180	30.0 / 30.0	0.6	70.7 / 70.5	112 / 67	- / -	113 / 73	- / -	119	-	
4/17/2018	180	30.0 / 30.0	0.5	70.6 / 70.5	120 / 72	- / -	118 / 80	- / -	117	-	
4/16/2018	180	30.0 / 30.0	0.6	70.2 / 69.5	104 / 66	- / -	118 / 78	- / -	121	-	
4/14/2018	180	30.0 / 30.0	0.5	70.7 / 69.5	106 / 65	- / -	117 / 74	- / -	123	-	
4/13/2018	180	30.0 / 30.0	0.5	70.9 / 69.5	114 / 77	- / -	120 / 82	- / -	123	-	
4/13/2018†	-	- / 30.0	-	- / 69.5	114 / 77	- / -	- / -	- / -	-	-	
4/13/2018	-	- / 30.0	-	- / 69.5	- / -	- / -	- / -	- / -	-	-	
Averages	179	29.8 / **	0.6	69.5 / **	118 / 75	117 / 79	120 / 78	- / -	121	-	

This report displays Confirmed and Unconfirmed Flowsheet information.
 † = Unconfirmed Flowsheet, * = Current value as of 5/10/2018, ** = Not calculated

NXSTAGE NX2ME CONNECTED HEALTH



TRAINING MATERIALS/YOUTUBE CHANNELS

The screenshot shows the YouTube channel page for 'Dialysis Pro's'. The channel name is 'Dialysis Pro's' with the handle '@dialysispros3913', 1.09K subscribers, and 10 videos. The channel description is 'Selection of dialysis training videos for the Nxstage Machine. Disclaimer: ...'. The channel is categorized under 'HOME', 'VIDEOS', 'LIVE', 'PLAYLISTS', 'COMMUNITY', 'CHANNELS', and 'ABOUT'. The main video featured is 'Video 2, Nxstage Preparing your SAK' with 34,289 views, posted 6 years ago. The video description states: 'How to prepare a SAK for Nxstage system one. Please note these videos are made by dialysis kings for their patients. Please follow your local hospitals/trust's policies and procedures'. Below the main video is a row of six smaller video thumbnails with their respective titles and view counts:

- How to install your pack (12K views • 5 years ago)
- Video 9, Alarm 11 (8.1K views • 6 years ago)
- Video 8, Alarm 10 (10K views • 6 years ago)
- Video 1, Nxstage Machine Overview (10K views • 6 years ago)
- Video 3, Nxstage Preparing your Machine (38K views • 6 years ago)
- Video 7, Nxstage End Treatment (19K views • 6 years ago)

Dialysis Pro's



FUTURE TECHNOLOGY?

- **Personalized home dialysis training** – virtual reality headsets will allow interactive, personalized patient training. It's here today, we've tried it!
- **Automated patient support at home** - instantly available to home patients at the push of a button or through a simple voice command. Augmented reality will allow nurses, physicians and technicians to see what patients see as they troubleshoot and solve issues.
- **New modalities** - wearable kidneys can potentially create a whole new home modality.
- **Nutritional support** – AI, leveraging lab data and dietician support to create customised kidney-friendly diets.
- **Inventory control and connectivity** - Radio-frequency identification and smart home dialysis technology to automatically communicate with the dialysis provider to manage home stock levels.





Derbyshire Support & Facilities Services Limited

Managed ICT & Digital Services for Healthcare



User Centric Solution Design



Managed Procurement Process



Fully Managed Delivery



Ongoing Support & Lifecycle Management

Excellent Service Delivered by Excellent People

Responsive 

We are always responsive to our customers' requirements and requests – acting promptly, doing what we've agreed, meeting and exceeding expectations and ensuring concerns are addressed and issues are resolved

Reliable 

We are always reliable - our patients and our customers can depend on us to provide environments for patient care and workplaces that are welcoming, safe, clean and sustainable, along with services that are high-quality, high-performing and focused on customer need

Resourceful 

We are resourceful in our approach - creative, imaginative and empowering; and giving everyone in our DSFS team permission to challenge 'the norm', to seek out solutions and to make decisions that improve the facilities and support services we provide

Respectful 

We are respectful, kind and professional - helping and supporting our DSFS and Trust colleagues, our patients and our customers; presenting ourselves positively and meeting the highest quality standards in everything we do



ANY QUESTIONS?

