Managing Patients with CKD in Primary Care: A Shared Care Pathway

5th April 2018

Learning Objectives

1) What health risks does CKD represent?

2) Why change how we manage CKD in NWL?

1) How do we improve CKD management in NWL?

Reference: Kerr, M *et al* (2012) Estimating the financial cost of chronic kidney disease to the NHS in England. Nephrol Dial Transplant

Nice Guidance Classification

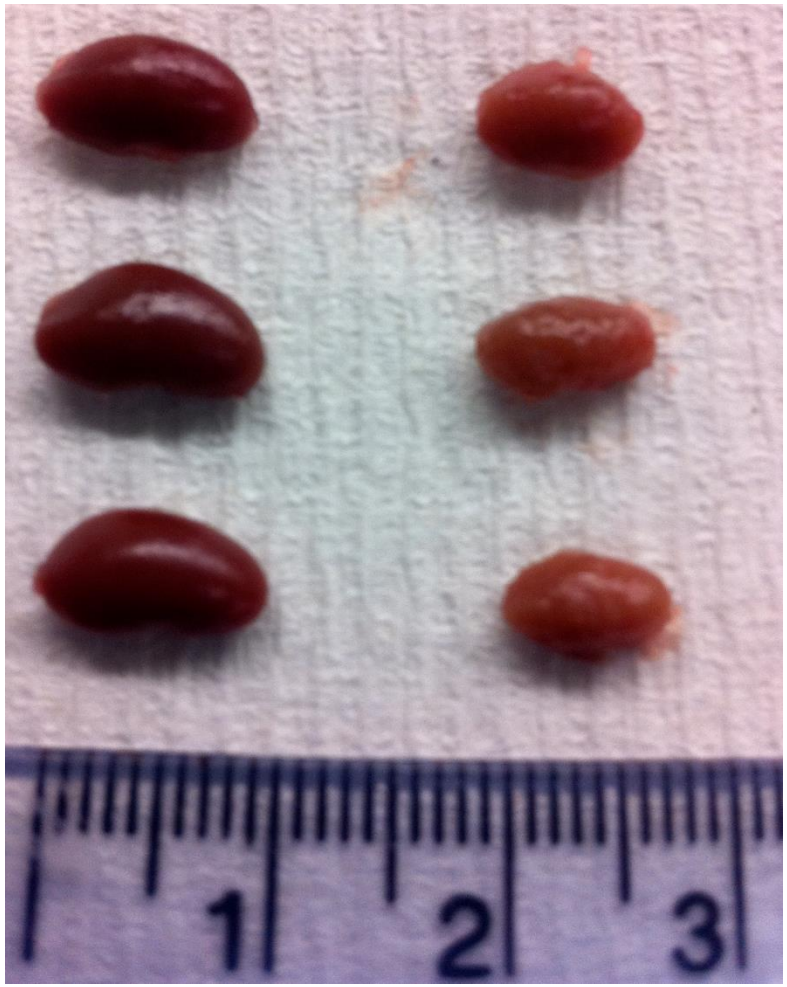
GFR and ACR categories and risk of adverse outcomes			ACR categories (mg/mmol), description and range		
			<3 Normal to mildly increased	3–30 Moderately increased	>30 Severely increased
			A1	A2	A3
GFR categories (mL/min/1.73 m²), description and range	≥90 Normal and high	G1			
	60–89 Mild reduction related to normal range for a young adult	G2			
	45–59 Mild–moderate reduction	G3a			
	30–44 Moderate–severe reduction	G3b			
	15–29 Severe reduction	G4			
	<15 Kidney failure	G5			

Increasing risk

Increasing risk

ACR=albumin:creatinine ratio; CKD=chronic kidney disease; eGFR=estimated glomerular filtration rate; GFR=glomerular filtration rate. Adapted from: NICE (2014) *Chronic kidney disease: early identification and management of chronic kidney disease in adults in primary and secondary care (CG182)*. Available at: http://www.nice.org.uk/cg182 (accessed: 29.09.2014)

Chronic kidney disease



Acute Kidney Injury

	ACR <10	ACR 10-29	ACR 30-299	ACR ≥300
eGFR > 105	Ref	Ref	2.7	8.4
eGFR 90-105	Ref	Ref	2.4	5.8
eGFR 75-90	Ref	Ref	2.5	4.1
eGFR 60-75	Ref	Ref	3.3	6.4
eGFR 45-60	2.2	4.9	6.4	5.9
eGFR 30-45	7.3	10	12	20
eGFR 15-30	17	17	21	29

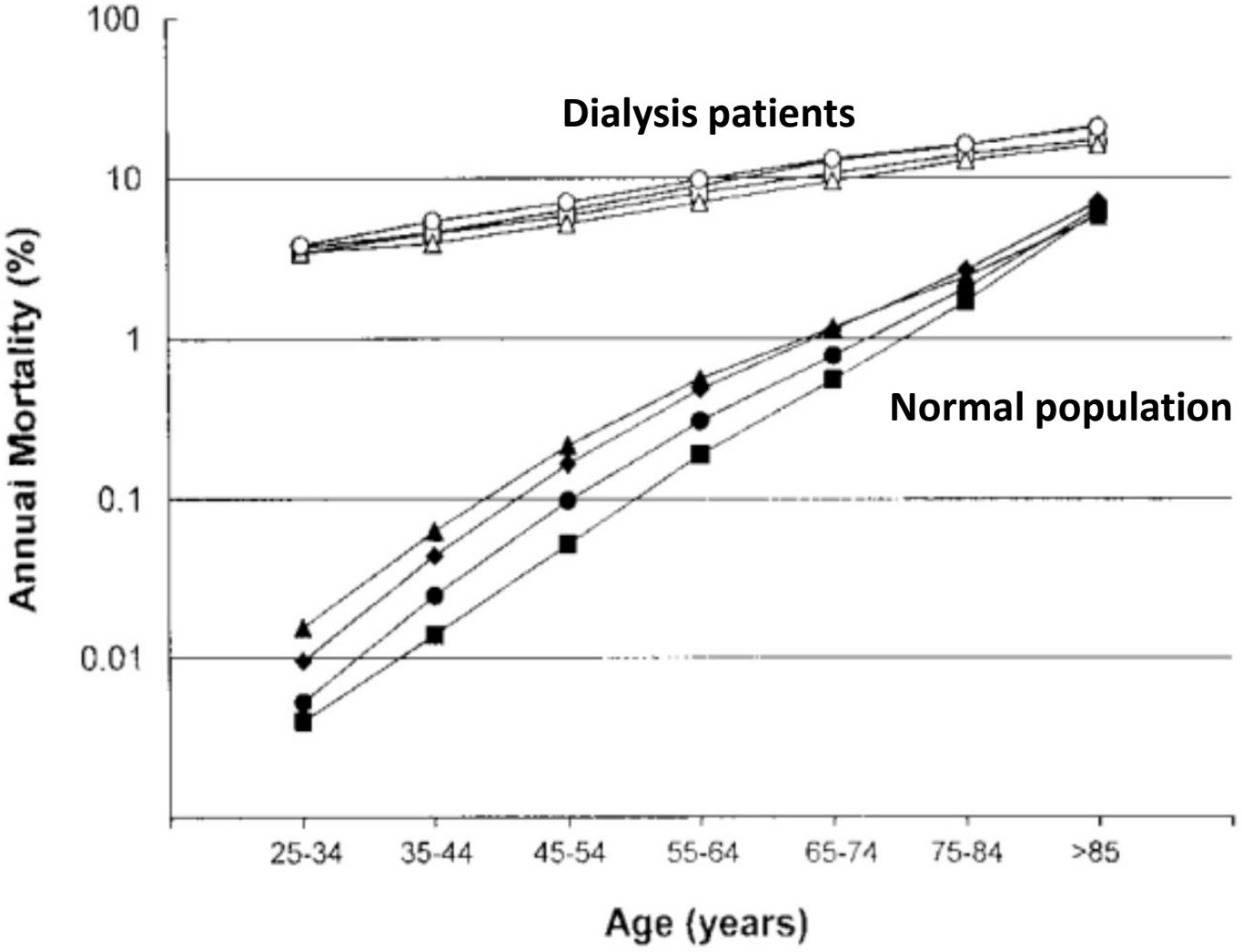
Kidney failure (ESRD)

	ACR <10	ACR 10–29	ACR 30–299	ACR ⩾300
eGFR > 105	Ref	Ref	7.8	18
eGFR 90–105	Ref	Ref	11	20
eGFR 75–90	Ref	Ref	3.8	48
eGFR 60–75	Ref	Ref	7.4	67
eGFR 45–60	5.2	22	40	147
eGFR 30–45	56	74	294	763
eGFR 15–30	433	1044	1056	2286

Cardiovascular mortality

	ACR <10	ACR 10–29	ACR 30–299	ACR ⩾300
eGFR > 105	0.9	1.3	2.3	2.1
eGFR 90–105	Ref	1.5	1.7	3.7
eGFR 75–90	1.0	1.3	1.6	3.7
eGFR 60–75	1.1	1.4	2.0	4.1
eGFR 45–60	1.5	2.2	2.8	4.3
eGFR 30–45	2.2	2.7	3.4	5.2
eGFR 15–30	14	7.9	4.8	8.1

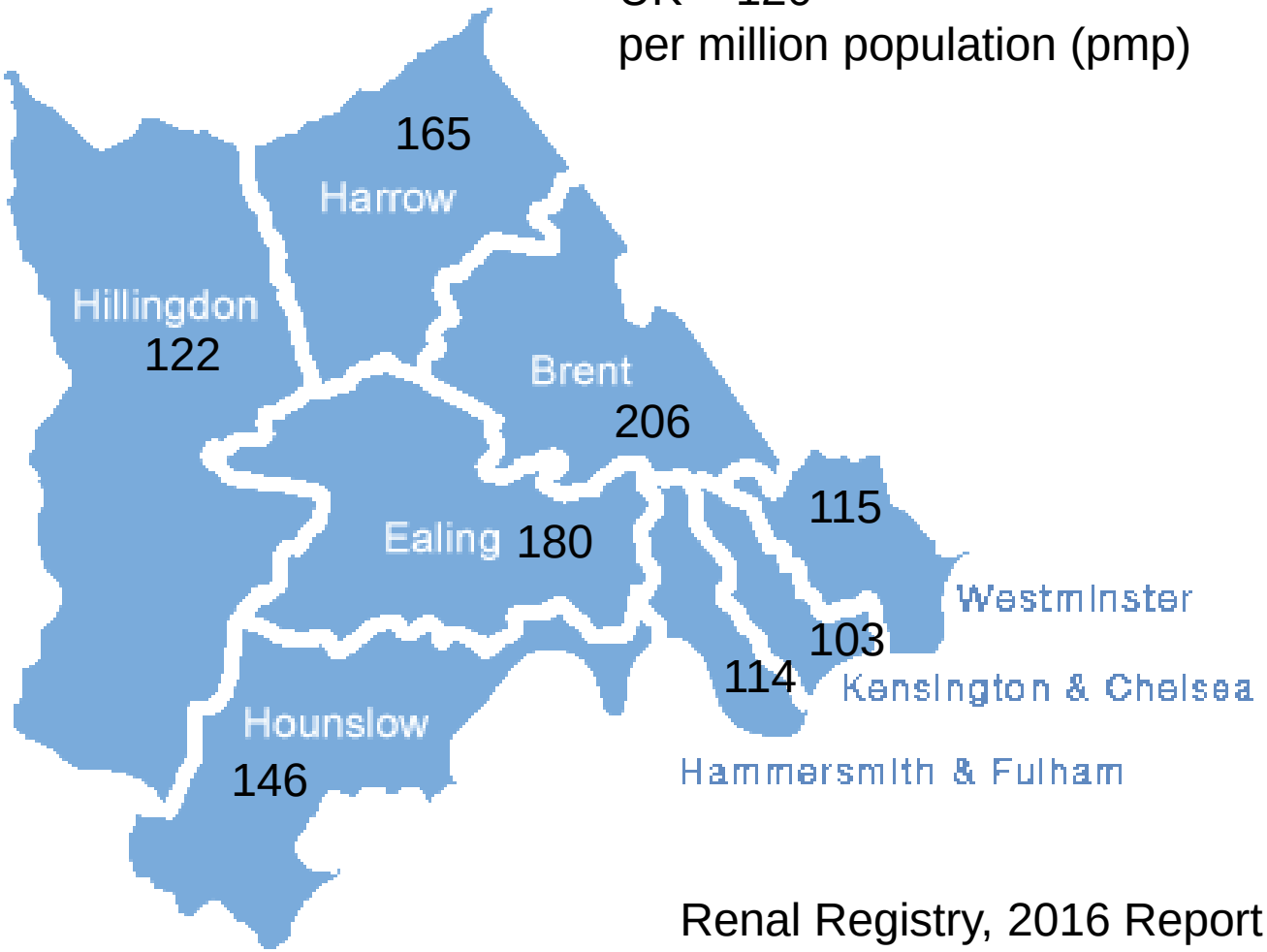
Increased cardiovascular mortality in renal disease



USRDS data; Levey et al, AJKD, 1998

Incidence of end-stage renal disease

UK = 120
per million population (pmp)



Renal Registry, 2016 Report

Observations

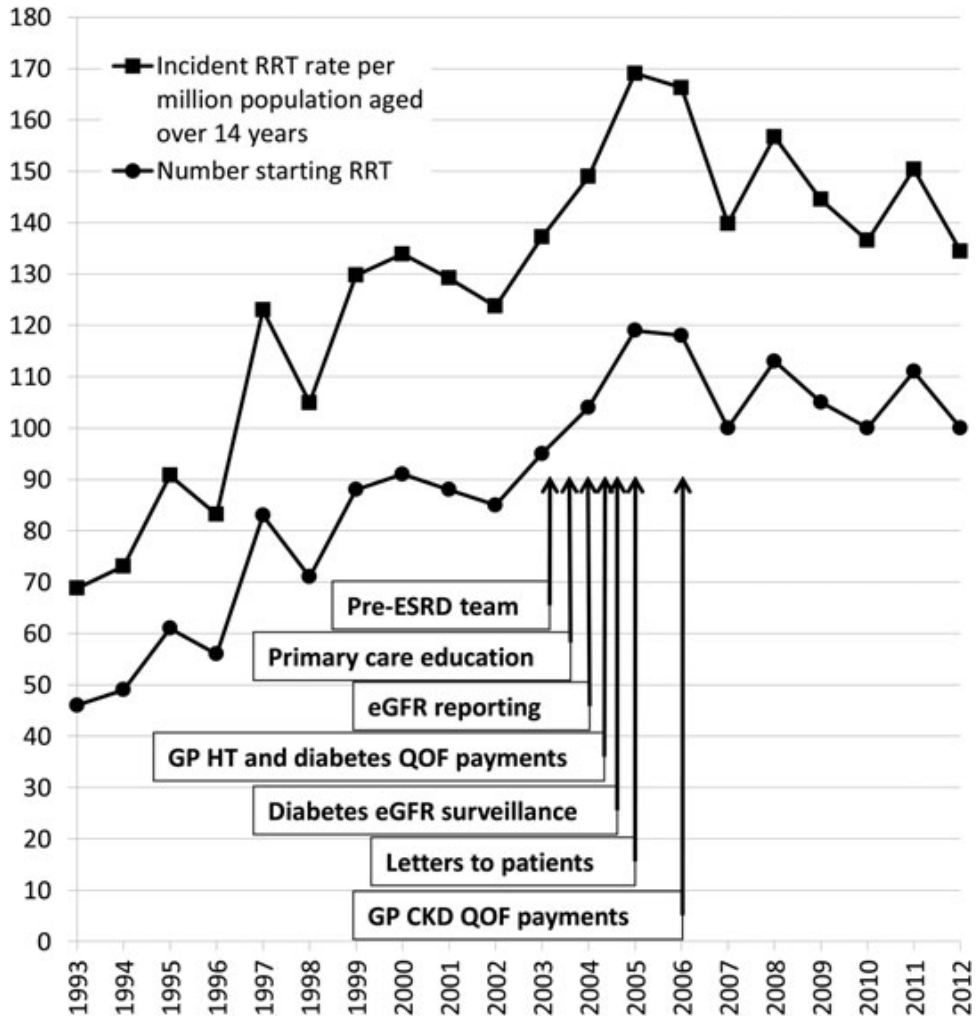
- Cardiovascular disease remains associated with CKD with increased mortality

- Estimated annual cost of managing an individual's:
  - CKD = £235
  - Transplant = £12,000
  - Dialysis = £27,000

- Significant number of patients have non-progressive CKD who do not require specialist input

Reference: Kerr, M *et al* (2012) Estimating the financial cost of chronic kidney disease to the NHS in England. Nephrol Dial Transplant

West Midlands Experience



Rayner et al, NDT 2013

CKD pathway redesign in NWL

Aims:

1. Reduce incident ESRD growth
2. Stabilise prevalent ESRD cohort in NWL
3. Reduce unnecessary clinic attendance
4. Increase discharges from secondary care
5. Improve care & experience of CKD in NWL
6. Support self management and community care

Identify and focus upon those at risk

Ensure that patients are treated according to NICE guidance to reduce or prevent progression across the system

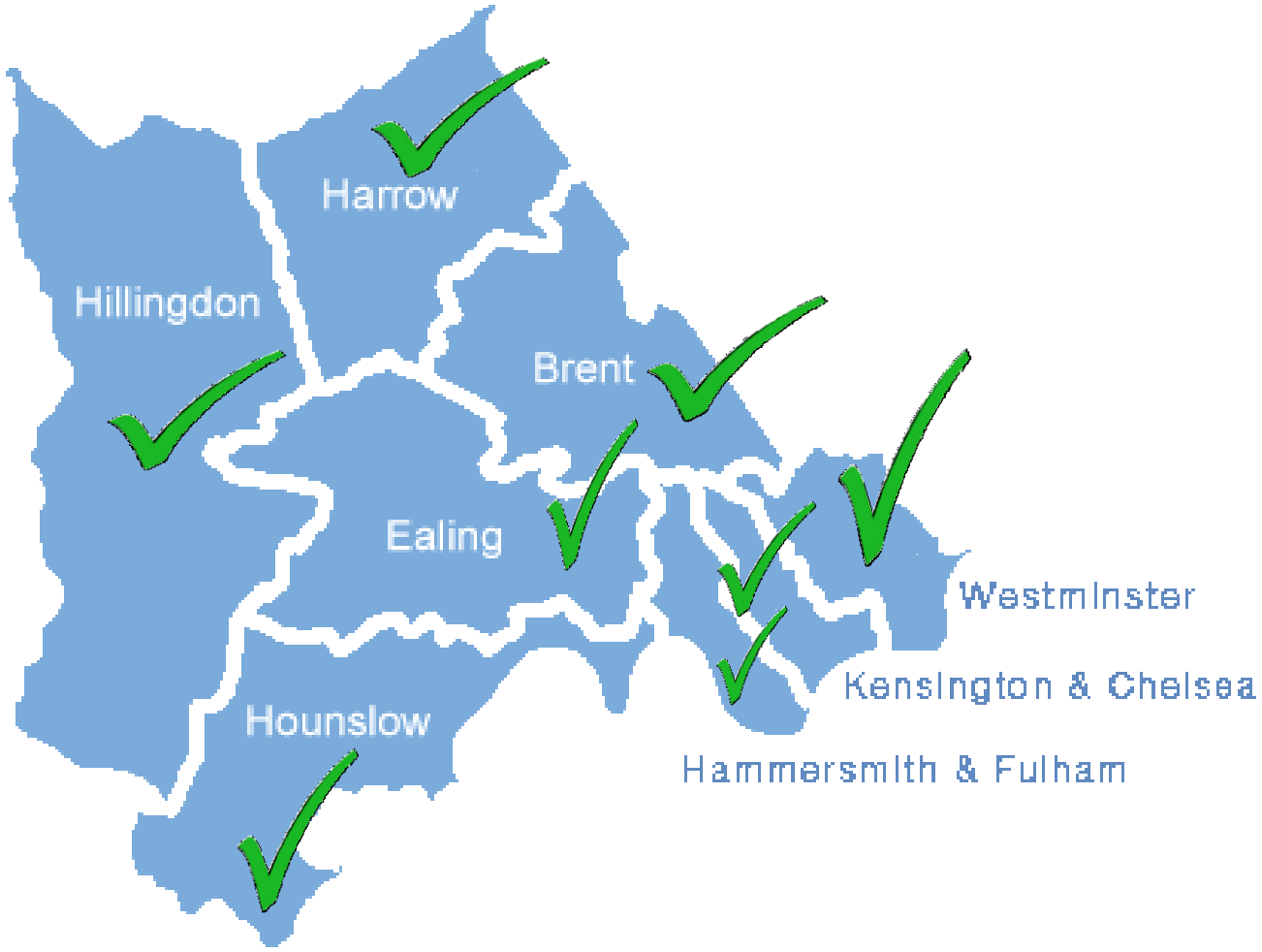
Improve the efficiency of care for patients with CKD

Improve the planning for ESRD management for those that deteriorate

Activities

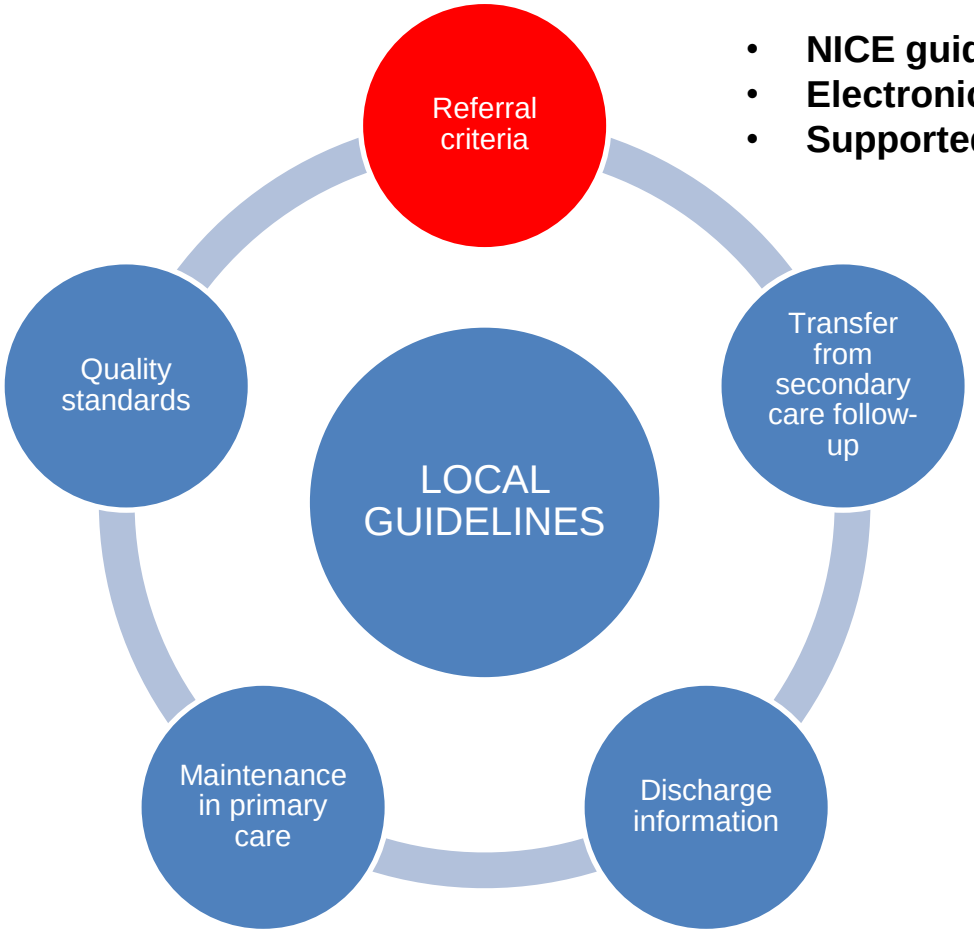
- CKD shared care programme and pathway re-design with virtual clinics
- E-advice service
- Consultant outreach into primary care (CC4A: Connecting Care for Adults with long term conditions)

Current Engagement



Constituents of the pathway

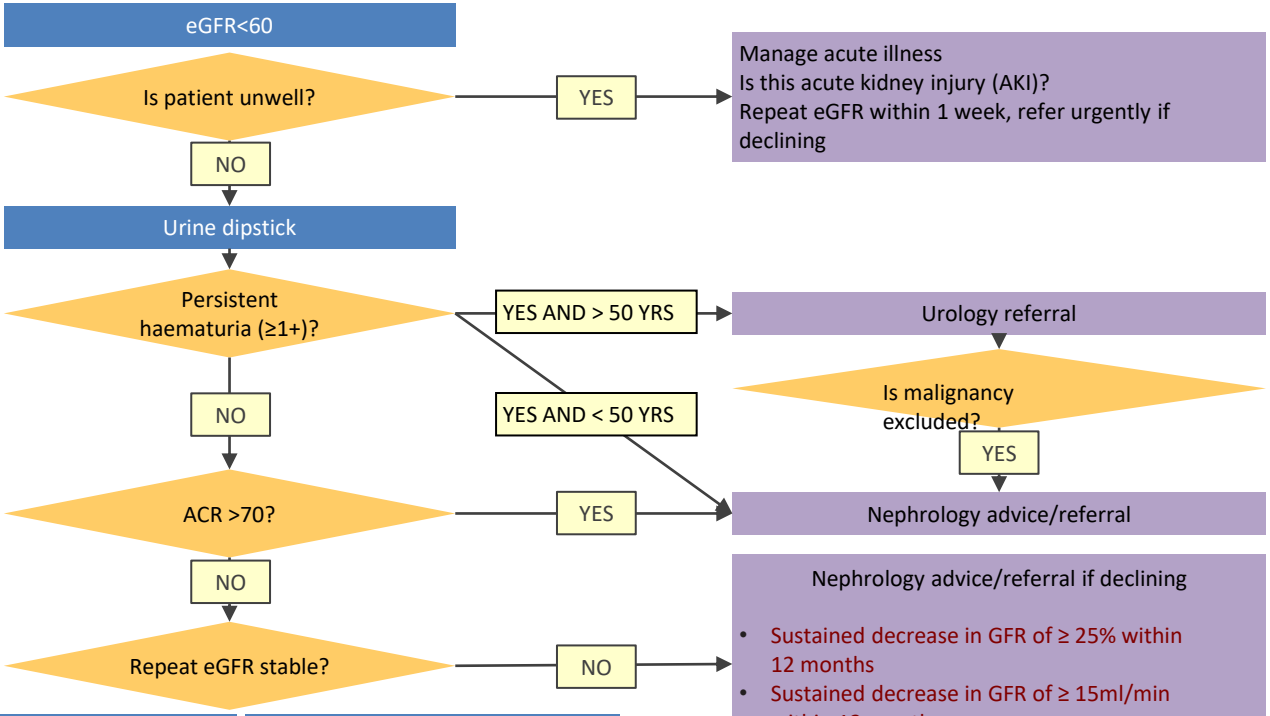
Constituents of the pathway



- **NICE guidance**
- **Electronic referral forms**
- **Supported by e-advice**

CHRONIC KIDNEY DISEASE – REFERRAL ALGORITHM

Endorsed by CWHHE Diabetes Strategy Group



STAGE G3a and G3b	STAGE G4 - 5
Monitor according to page 3	Most patients with CKD 4/5 should be being followed in secondary care HOWEVER – if RRT not indicated (eg. frail elderly), management of advanced CKD may be appropriate in primary care

URGENT REFERRAL

- Suspected multisystem disease with evidence of renal involvement
- Acute kidney injury (without an obvious cause manageable in primary care)
- Newly diagnosed eGFR < 15
- Nephrotic syndrome
- Accelerated hypertension
- Severe hyperkalaemia (>6.5mmol/L)

Minimum information for referral

- Dates and results of previous creatinine/eGFR measurement
- Medical history
- Drug history
- Current BP
- Urine dipstick and ACR if dipstick positive

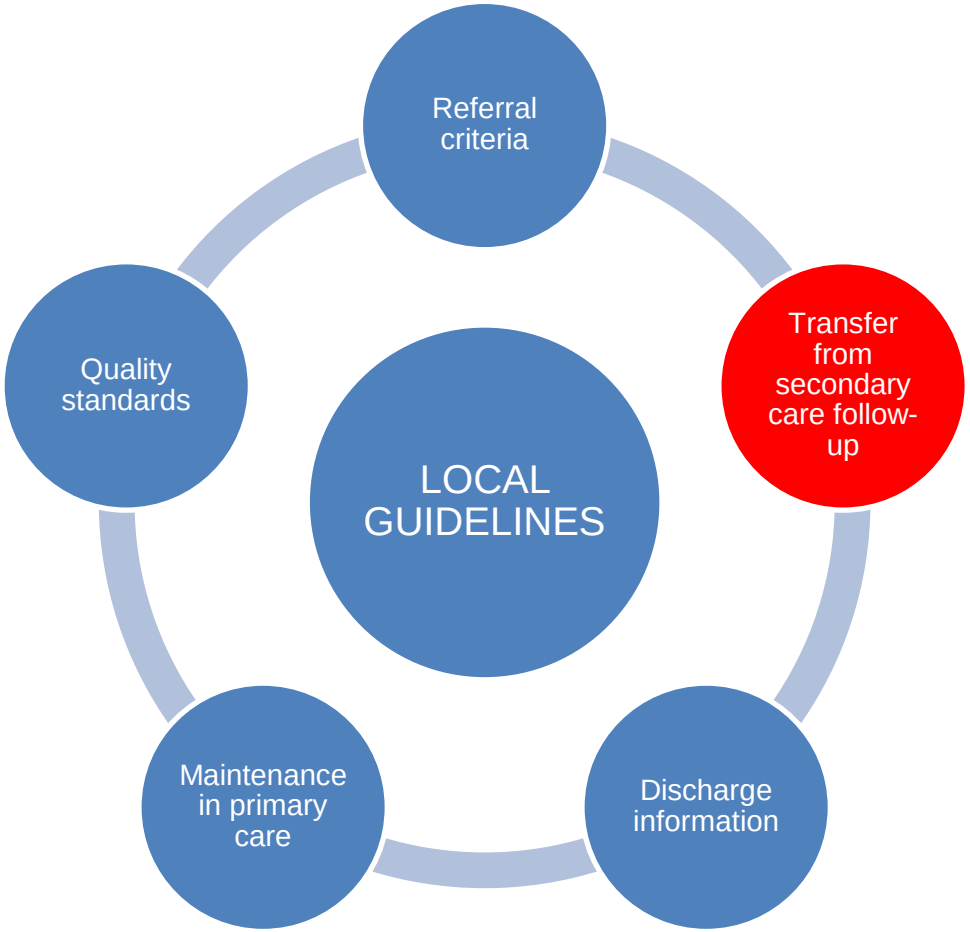
Renal Ultrasound if:

- accelerated progression of CKD
- visible or persistent invisible haematuria
- symptoms of urinary tract obstruction
- family history of polycystic kidney disease and are aged over 20 years
- eGFR of <30 ml/min/1.73 m2 (GFR category G4 or G5)

Email advice from nephrology consultants is available to North West London primary care services:

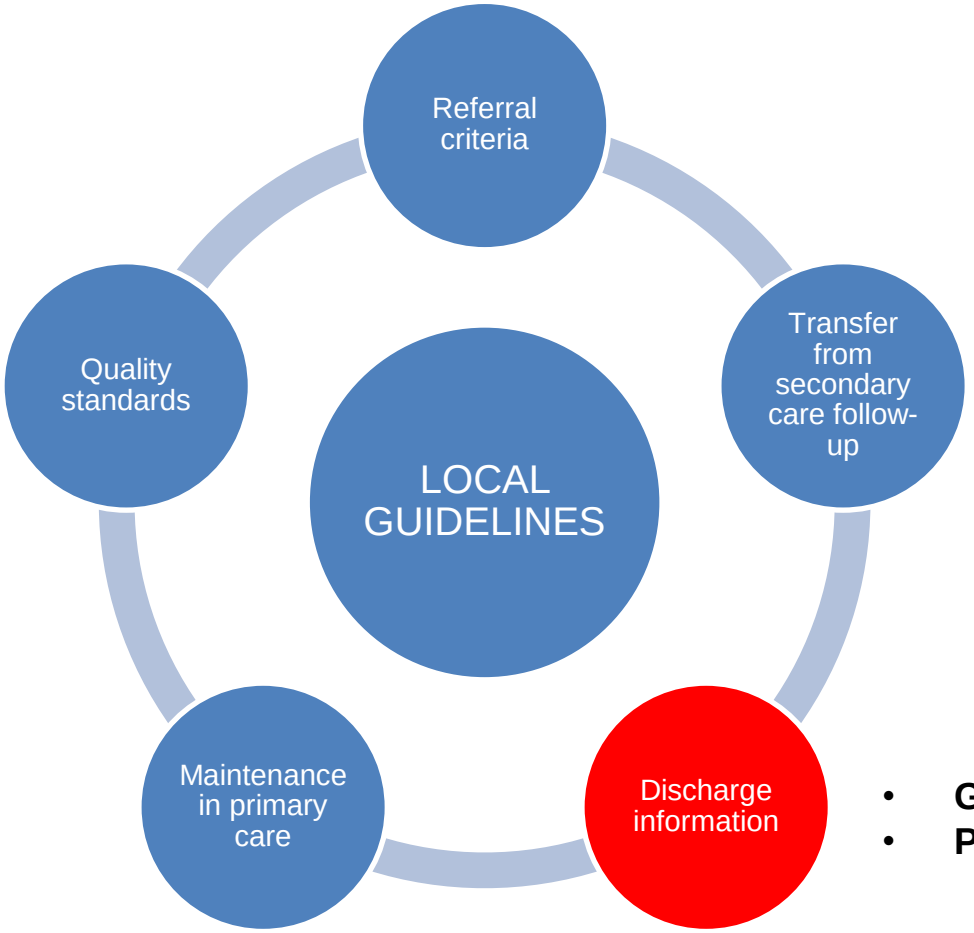
- ICHC-tr.ckdadvice@nhs.net

Constituents of the pathway



- **Unlikely to require specialised renal intervention**

Constituents of the pathway



- **General practitioner**
- **Patient**

Discharge Pack

GPs receives a discharge letter informing them

Patient suitable for community management

Guidance for monitoring and frequency

Criteria for re-referral

Copy of patient information sheet and letter

Notification that the patient will be entered onto the quality audit database

Patients receive

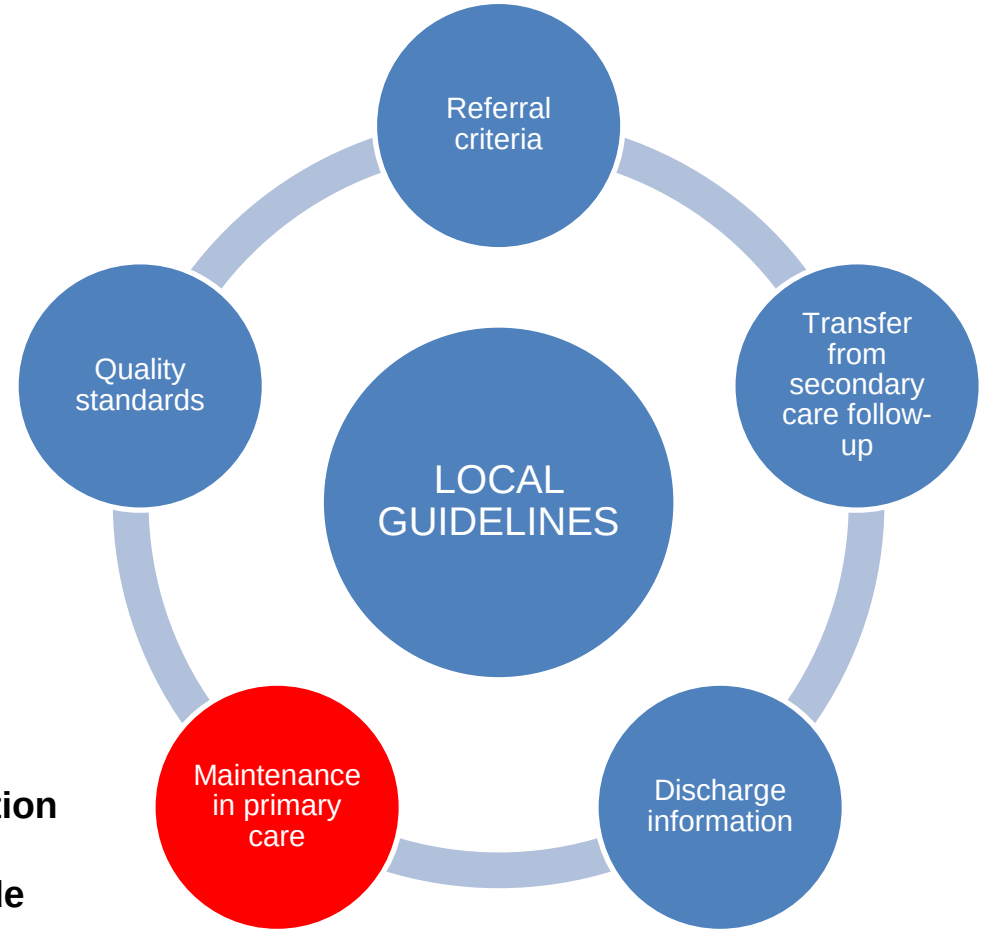
Discharge letter

Information sheet with advice on management of cardiovascular risk

Contact information and useful website flyer

Notification that they will be entered onto the quality audit database

Constituents of the pathway



- **Lifestyle**
- **Vein preservation**
- **BP <140/90**
- **RAAS blockade**
- **Monitor eGFR**

CHRONIC KIDNEY DISEASE – ONGOING MANAGEMENT

Endorsed by CWHHE Diabetes Strategy Group

MANAGEMENT OF STABLE CKD

Agree management plan with patient

Lifestyle advice (Exercise/Weight/Meditation)
Smoking cessation advice

BP:

- Encourage home BP monitoring
- Target BP: < 140/90 if ACR ≤ 70
  < 130/80 if ACR > 70
- Caution of BP targets in frailty (See page X)
- Prioritise ACEi/ARB with associated sick day guidance

Cardiovascular risk:

- Aspirin – if CV risk at 10yrs >20%
- **Proton-pump inhibitors (PPIs)** – esp. if higher risk of gastric irritation with aspirin. Observational data suggest PPIs may cause insidious inflammatory kidney injury –switch to ranitidine if eGFR falling
- Statins – treat according to national guidelines

Avoid NSAIDs

Vaccinate for influenza and pneumococcus

RENAL ANAEMIA

Patients with progressive CKD can develop renal anaemia which usually manifests from CKD3b and beyond. This may require treatment with erythropoietin. Renal anaemia should only be diagnosed after exclusion of other causes including iron deficiency, folate or B12 deficiency, haemolysis. Renal anaemia is unusual prior to CKD3b but if suspected, nephrology advice should be sought.

FREQUENCY OF MONITORING eGFR (NUMBER OF TIMES PER YEAR)

GFR and ACR categories and risk of adverse outcomes			ACR categories (mg/mmol) description and range		
			<3 Normal to mildly increased	3-30 Moderately increased	>30 Severely increased
			A1	A2	A3
GFR categories, description and range	≥ 90 Normal and high	G1	≤1	1	≥1
	60-89 Mild reduction related to normal range for a young adult	G2	≤1	1	≥1
	45-59 Mild-moderate reduction	G3a	1	1	2
	30-44 Moderate-severe reduction	G3b	≤2	2	≥2
	15-29 Severe reduction	G4	2	2	3
	≤15 Kidney failure	G5	4	≥4	≥4

Increasing risk

Increasing risk

RENIN-ANGIOTENSIN SYSTEM INHIBITORS IN CKD (ACEI and ARB)

- ACEi and ARB prevent scarring in CKD and should be used preferentially in patients with proteinuria
- Assess kidney function and electrolytes. 1-2 weeks after initiating therapy, watch out for hyperkalemia
- Assess kidney function after any subsequent increase in dose
- A small rise in creatinine or a mild fall in eGFR values is expected with therapy – repeat the assessment of kidney function if the rise in creatinine is greater than 15%
- STOP therapy - If serum creatinine rises by >30% or eGFR falls by >25% fall seek specialist advice (to exclude possible renovascular disease)
- If K>6.0 stop ACEi/ARB and start low potassium diet – if the patient has proteinuria and would benefit from an ACEi/ARB seek Nephrological advice as introduction of frusemide or bicarbonate can facilitate reintroduction of these agents
- Cautious use of ACEi/ARB with spironolactone and other potassium sparing diuretics, very close monitoring of potassium required.

DraftV6.0 Date of preparation: March 2018. For review: April 2018

Sick Day Rules

When unwell:

- Vomiting / diarrhoea
- Unable to eat / drink
- Fevers

Miss out for 2-3 days:

- ACE-inhibitors (ACEis)
- Angiotensin-receptor blockers (ARBs)
- Direct renin inhibitors (eg. Aliskerin)

- Sodium-glucose cotransporter-2 inhibitors (SGLT2)
- Diuretics

- Non-steroidal anti-inflammatory drugs

- Metformin
- Sulphonylureas (eg. gliclazide)
- Short-acting insulin

After 2-3 days:

- Feeling better = resume medications

- No better = seek medical attention

CHRONIC KIDNEY DISEASE – COMMON DRUGS

Endorsed by CWHHE Diabetes Strategy Group

Proton-pump inhibitors (PPIs)

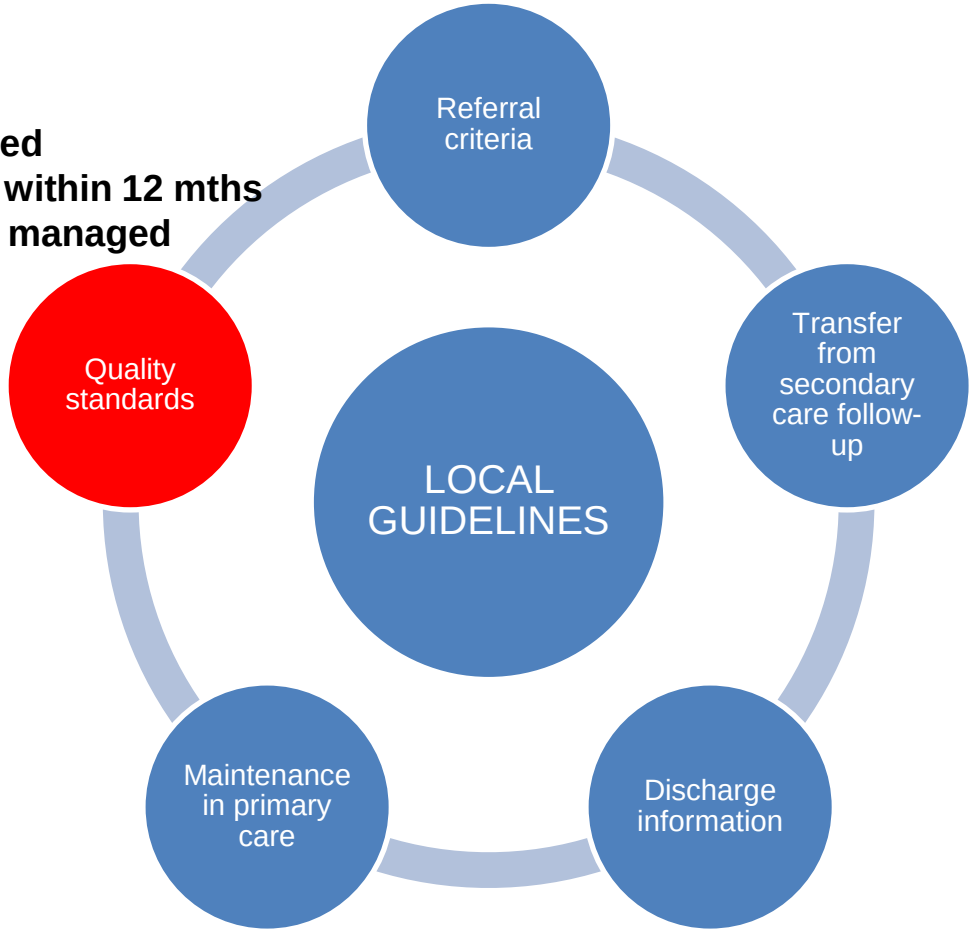
- Should be considered if there is a higher risk of gastric irritation with aspirin or when the patient has more advanced CKD (eGFR <20)
- Observational data suggest PPIs may cause insidious inflammatory kidney injury – therefore switch to ranitidine if eGFR falling whilst on PPIs

ANTIBIOTIC	Issue in reduced kidney function	Recommendation for use
Trimethoprim	Raises serum potassium and creatinine ~20% (affects tubular function but not nephrotoxic per se)	Safe for use if eGFR>30 but may transiently elevate K and creatinine – repeat bloods 1-2 weeks later to ensure resolution
Nitrofurantoin	Requires filtration and tubular secretion. Reduced excretion in CKD and high levels cause peripheral neuritis	Do not use if eGFR<45. May cause toxicity and not reach high enough urinary concentrations to be effective
Penicillin	Risk of crystalluria	Generally safe but avoid maximum doses if eGFR<15
Macrolides (eg. Clarithromycin)	Renally excreted, can cause neurotoxicity	Reduce dose by 50% when eGFR<30
Quinolones (eg. Ciprofloxacin)	Renally excreted, risk of tendonopathy and potentially nephrotoxic	Reduce dose by 50% when eGFR <15
Tetracyclines	Partly renally cleared; doxycycline safer	Reduce dose when eGFR<45

HYPOGLYCAEMIC AGENT	eGFR = 45-59 (CKD stage 3a)	eGFR = 30-44 (CKD stage 3b)	eGFR <30 (CKD stage 4-5)
Metformin	Safe to use	Reduce dose	Stop
Gliclazide	Safe to use	Safe to use	Use with caution; reduce dose
DPP-4 inhibitors (eg. Linagliptin, Sitagliptin)	Safe to use	Adjust dose according to licence (only Linagliptin unchanged = 5mg OD)	Adjust dose according to licence (only Linagliptin unchanged = 5mg OD)
SGLT-2 inhibitors (eg. Canagliflozin, Empagliflozin)	Reduce dose (Cana- and Empa-gliflozin) Stop Dapagliflozin	Stop	Stop
GLP-1 inhibitors (eg. Liraglutide, Exanatide)	Adjust dose according to licence	Adjust dose according to licence	Stop if eGFR<15 (Liraglutide, Dulaglutide safe if eGFR>15)
Pioglitazone	Safe to use	Safe to use	Safe to use

Constituents of the pathway

- **BP target achieved**
- **eGFR measured within 12 mths**
- **Change in eGFR managed**



1 year follow-up data

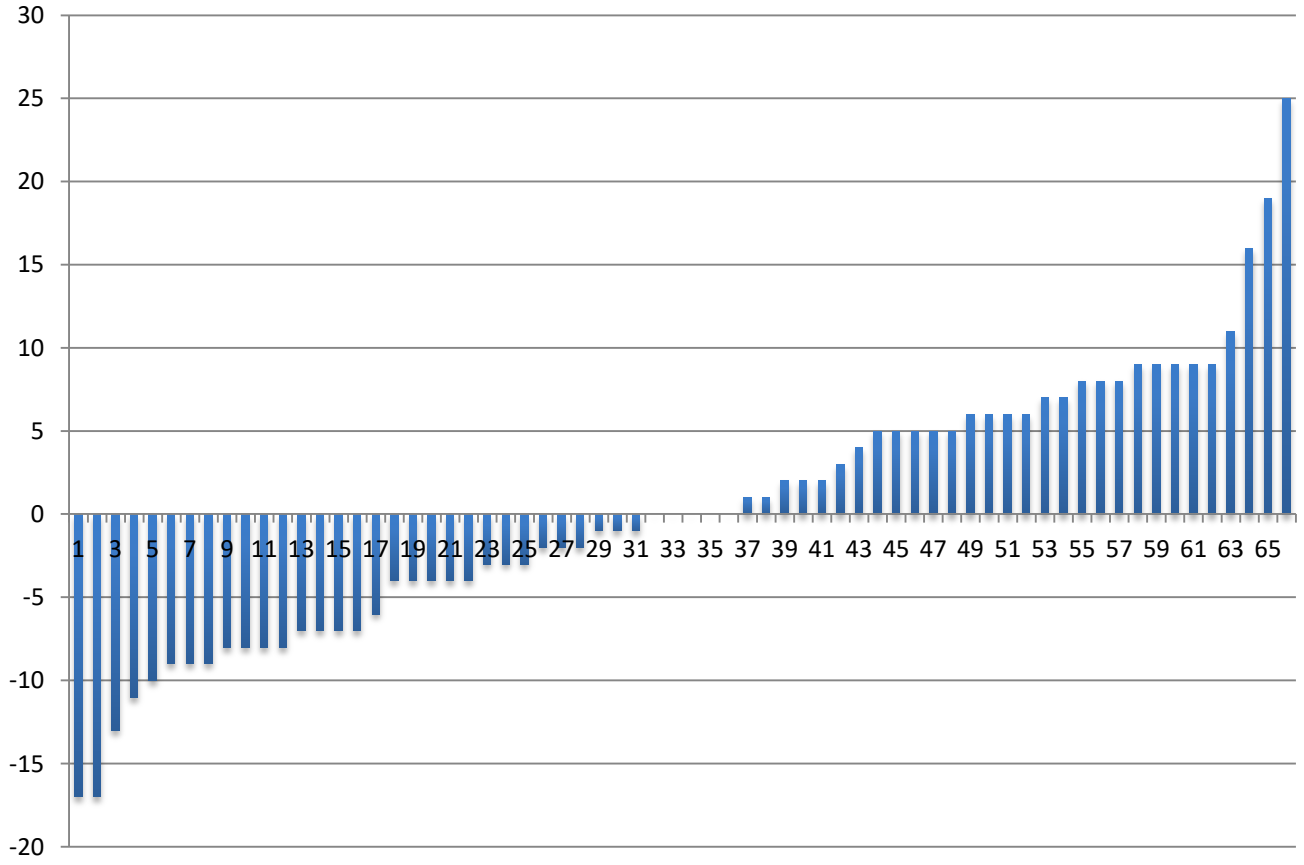
- Using Whole Systems Integrated Care (WSIC) platform
- Available data for 66% of patients

- Of those:
- 74% within 1yr (+/- 3 mths)
- 92% within 1yr (+/- 6 mths)

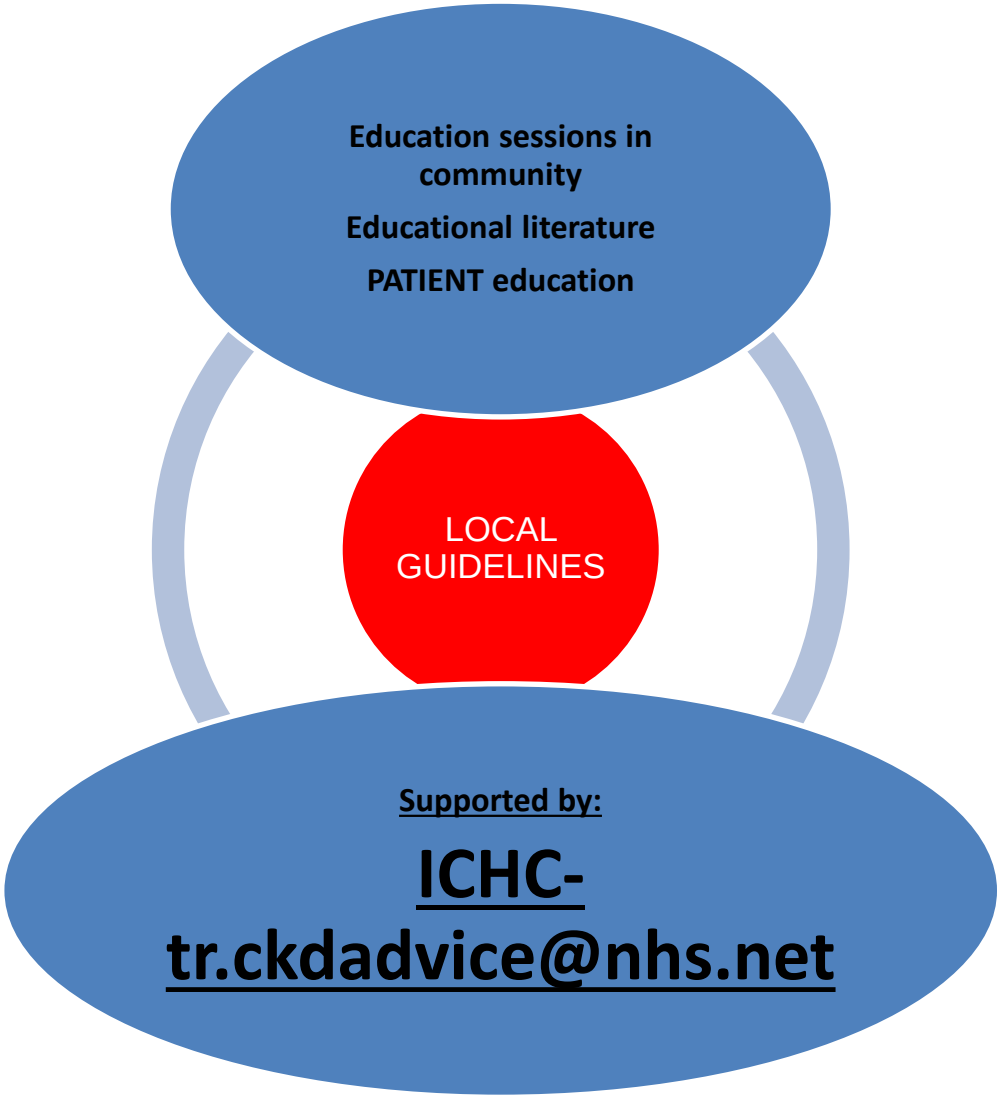
Medians (range)	2015 (transfer)	2016 (1yr follow-up)
systBP	131 (107-196)	132 (95-168)
diastBP	76 (52-103)	77 (50-107)
sCreatinine	135 (69-243)	131 (71-279)
eGFR	42 (25->90)	42 (14-71)

Change in eGFR at 1 year

(median = 0 mL/min/1.73m^2)



17 individuals >5mL/min/m2 eGFR fall in 1 yr (26% of 66 total)

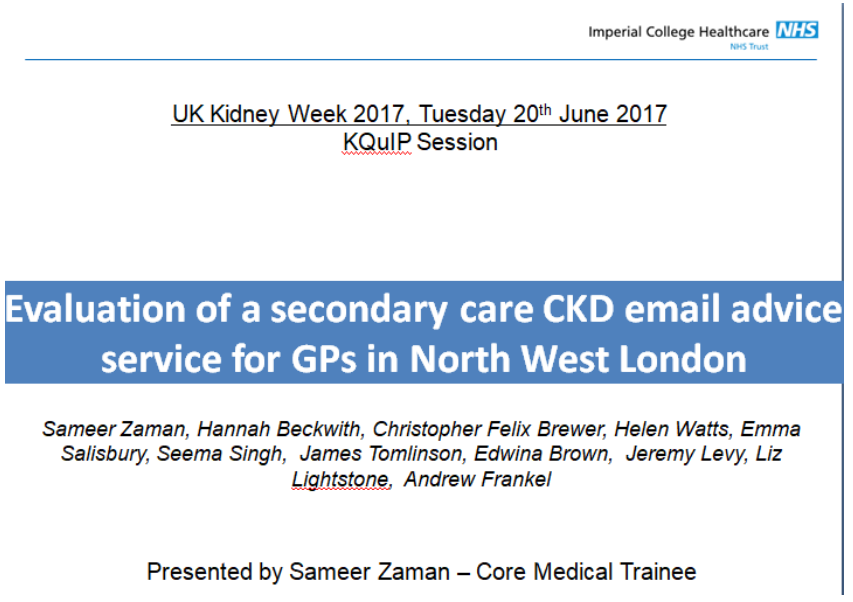

Education sessions in community
Educational literature
PATIENT education
LOCAL GUIDELINES
Supported by:
ICHC-tr.ckdadvice@nhs.net

CURRENT STATUS

- >30 community education CKD sessions delivered
- >700 patients transferred from renal OPD into shared care
- E-advice service feedback and clinic attendance avoidance
- Re-organisation of HH and CXH Nephrology services – freeing up capacity to increase service available for patients with stage 4 CKD / near ESRF as well as supporting patients to continue care out of hospital

Imperial CKD email advice service

- Explicitly for questions on CKD
- Guaranteed answer in <24 hours weekdays
- Rotation of 4 consultants
- Unfunded



Imperial CKD email service: data

- Over 10 months Jan – Nov 2016: 105 emails (0.5 emails / working day)
- Mean response time 23 hours
- Most common Qs:
  Risk factor modification (20%)
  Referral triggers (19%)
  Prescribing (19%)
  Management of decline in GFR (18%) BP (17%)
  Radiology advice (9%)

Zaman et al 2017

Imperial CKD email service: data

Number of GPs requesting referral to Nephrology outpatient clinic	21 (20%)
Advised to refer to Nephrology clinic at that point	2 (10%)
Advised that referral currently not required	17 (81%)
Triggers for future referral identified	9 (43%)
Advised to refer to another speciality clinic	2 (10%)

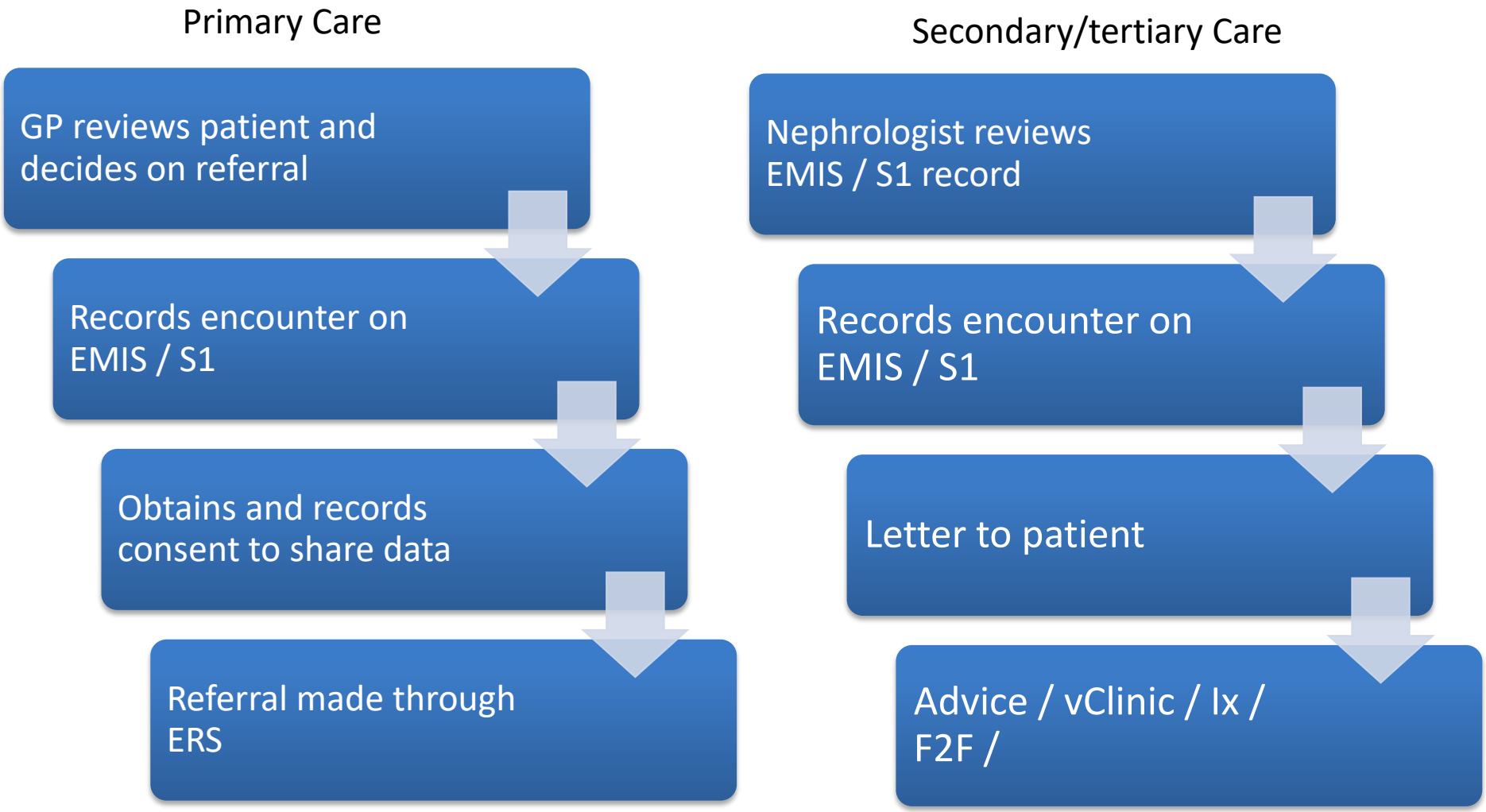
Zaman et al 2017

Imperial CKD email service: data

- GP satisfaction: (*41% response rate)*
  100% would recommend to colleague
  100% satisfied with response and timeliness
  67% would have referred patient to OP if not used the email service (=30 patients in sample)
  10% would have sent patient to ED (4 patients)
- "the clearest advice of all the email advice services"

Zaman et al 2017

Virtual Triaging / Clinic



Thank you

Email advice: ICHC-tr.ckdadvice@nhs.net

Website / resources: http://www.hounslowccg.nhs.uk/what-we-do/improving-ckd-care.aspx