GAIN
GUIDELINES AND AUDIT IMPLEMENTATION NETWORK

The Regulation and Quality Improvement Authority

UPDATE

Northern Ireland Guidelines for the Management of Chronic Kidney Disease (CKD)

Practical Points for Use of Estimated GFR and Albuminuria (ACR) in Assessing CKD

Developed by GAIN and the Northern Ireland Nephrology Forum

This Guideline supersedes February 2010

May 2015

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Introduction

Chronic kidney disease (CKD) is common, usually unrecognised and often exists in association with other conditions such as diabetes and cardiovascular disease. CKD is a general term covering a number of primary disease processes that result in structural and/or functional kidney abnormalities persisting for at least three months.

CKD has emerged as a significant public health problem with up to 10% of adults having evidence of underlying CKD or risk factors for CKD (Table 1). The majority of persons with CKD have slow loss of kidney function and only a minority progress to end-stage renal disease (ESRD) that requires renal replacement therapy (RRT). Moderate or severe CKD is also associated with an increased risk of cardiovascular events, acute kidney injury, falls, frailty and mortality.

Table 1: Prevalence of Chronic Kidney Disease

Stage	Description	eGFR ($mL/min/1.73m^2$)	Population Prevalence
1	CKD with normal GFR + other kidney damage	>90	3.3%
2	Mild CKD and other kidney damage	60-89	3.0%
3a	Mild to Moderate CKD	45-59	4.3%
3b	Moderate to Severe CKD	30-44	
4	Severe CKD	15-29	0.2%
5	Established renal failure	<15 or on dialysis	0.2%

One challenging issue is that CKD is often not diagnosed because persons with kidney disease usually have no specific symptoms. Late diagnosis of advanced CKD is associated with increased morbidity and mortality. There is evidence that earlier treatment may delay or prevent progression of CKD to end-stage renal disease (ESRD), reduce complications and reduce the risk of cardiovascular disease.

CKD is no longer specifically incorporated in the General Practice Quality and Outcomes Framework (QOF). However the five QOF indicators are hopefully embedded in practice (generation of a register of patients with chronic kidney disease, measurement of blood pressure, treatment of blood pressure to target, use (if appropriate) of ACEi or ARB medication in patients with CKD and quantitative assessment of proteinuria). This 2015 guideline updates and replaces the 2010 GAIN Guideline for the Management of Chronic Kidney Disease following the publication of the 2014 NICE Guideline on Chronic Kidney Disease (CG 182).

The new and updated areas include reference to

- Identification and investigation of people who have or are at risk of developing CKD
- Classification of CKD
- The definition of CKD progression
- The relationship between Acute Kidney Injury (AKI) and CKD
- Pharmacotherapy for CKD

Methodology

Who is the Guideline Intended For?

The guideline is relevant to all healthcare professionals who come into contact with patients with chronic kidney disease.

It is also expected that this guideline will be of value to those involved in clinical governance in both primary and secondary care to help ensure arrangements are in place to deliver appropriate care to this group of patients.

The remit of the guideline is to develop a guideline for professionals caring for patients with chronic kidney disease.

Terms of Reference for the Guideline

The Terms of Reference were developed by the Guideline Development Group (GDG) and would be:

- To write pragmatic clinical guidelines to help practitioners prevent, recognise, investigate and manage chronic kidney disease
- To integrate the clinical guideline into undergraduate and postgraduate clinical teaching

Involvement of Stakeholders

Key to the development of GAIN guidelines is the involvement of relevant professional and patient/carer organisations. A list of the GDG for Northern Ireland Guidelines for the Management of Chronic Kidney Disease (CKD) can be found in Appendix 5.

Needs Assessment

As part of the guideline development process, a meeting was held with the key stakeholders to identify pragmatic questions related to the prevention, recognition, investigation and management of CKD. The stakeholders also considered how the

guideline information could be incorporated into undergraduate and postgraduate clinical education in an effort to disseminate best practice.

The literature review for this guideline retrieved articles and guidelines published within the previous 10 years (2003-13). This was obtained by searching databases including Medline, Embase, Cinahl, PsycINFO and The Cochrane Library (Wiley). The main searches were supplemented by material identified by individual members of the development group. Criteria, inclusions and exclusions were identified and agreed by consensus across the GDG. Searches were limited to retrieve material published in English. A list of references can be found at http://www.gain-ni.org/index.php/audits/evidencetables.

Who Developed the Guideline?

Overview

Based upon methods outlined in the 'Advice for Guideline Development in Northern Ireland' document a team of health professionals, lay representatives, technical experts and GAIN known as the GDG (see Appendix 5), undertook the development of this clinical guideline. The basic steps in the process of developing a guideline were also taken from Appendix 5 of the 'Advice for Guideline Development in Northern Ireland' document.

The Guideline Development Group (GDG)

The Northern Ireland Guidelines for the Management of Chronic Kidney Disease (CKD) GDG were recruited by requests for nominations being sent to the main stakeholder organisations and patient organisations/charities.

At the start of the guideline development process all GDG members' interests were recorded on a standard declaration form that covered consultancies, fee-paid work, share-holdings, fellowships and support from the healthcare industry. At all subsequent GDG meetings, members were required to declare any new or arising conflicts of interest. No conflicts of interest were declared for this guideline.

Guideline Development Group Meetings

Six meetings were held between July 2014 and March 2015. During each meeting clinical questions and clinical and economic evidence were reviewed and assessed and recommendations formulated. At each meeting patient/carer and service-user concerns were routinely discussed as part of a standing agenda item.

The Chair divided the GDG workload by allocating specific topics, relevant to their area of clinical practice to small sub-groups of the GDG in order to simplify and speed up the guideline development process. These groups considered the evidence, as reviewed by the systematic reviewer, and synthesised it into draft recommendations prior to presenting it to the GDG as a whole. Discussion of potential organisations and financial barriers in applying these recommendations were considered by the Northern Ireland Regional Nephrology Forum and deemed as null and void for this guideline. This was reported back to the GDG by the Chairman.

Patient/carer Representatives

A user representative participated on the GDG providing valuable perspective on patient experience of CKD. The user representative reflected the views of persons living with chronic kidney disease in Northern Ireland.

Expert Advisers

During the development phase of the guideline the GDG identified areas where there was a requirement for expert input on particular specialist topic areas. The topics were addressed by either the production of a position paper or a formal presentation by a recognised expert who had been identified via the relevant registered stakeholder organisation. All relevant position papers are presented as part of the evidence review.

This guideline was peer reviewed and informed by the members of the Northern Ireland Regional Nephrology Forum and Northern Ireland Kidney Patients Association[1].

[1] Northern Ireland Kidney Patients' Association is a charitable voluntary organisation, dedicated to the support of Northern Ireland's kidney patients, their families and carers. http://www.nikpa.org/

Updating the Guideline

In keeping with GAIN requirements these guidelines will be reviewed in 2018 or sooner in light of any emerging evidence.

Funding

The GDG was commissioned by GAIN to develop this guideline. The GDG did not receive any payment or remuneration in kind for their work developing the guideline.

Clinical Audit

It is important that the implementation and usage of this guideline is continually monitored using the clinical audit process. Key areas identified within the guideline should be audited across each Trust area using the same clinical audit tool to ensure consistency of approach. This should take place on a yearly basis.

What is CKD and eGFR (estimated Glomerular Filtration Rate)?

- CKD can manifest as either reduced kidney function (reduced GFR) or urinary abnormalities (haematuria/proteinuria) or a combination of both present for more than 3 months.
- CKD is classified according to estimated GFR (eGFR) and the urinary albumin:creatinine ratio (ACR) (Table 2 and Table 3). G denotes the GFR categories (G1-5) which have the same GFR thresholds as the CKD stages 1 – 5.
- The ACR category is denoted as A (for albuminuria) with three categories: A1, A2 or A3. The ACR category has been introduced to emphasise that patients with higher levels of proteinuria (in any eGFR stage) have an increased risk of progression to ESRD and other adverse outcomes.
    - A1 is an ACR of < 3mg/mmol (normal)
    - A2 is an ACR in the range 3 – 30mg/mmol (micro-albuminuria)
    - A3 is an ACR > 30mg/mmol (macro-albuminuria often dipstick proteinuria)
- GFR in healthy young adults is approximately 100 mL/min/1.73m^2. An eGFR result can be explained to patients as an approximate percentage of normal kidney function.

- eGFR is an estimate of renal function (GFR) based on serum creatinine but also accounting for differences in gender, ethnicity and age which affect muscle mass and thus serum creatinine generation. Laboratories report it whenever any serum creatinine in patients aged 18 years or above is requested.
- If the eGFR is 60 mL/min/1.73m^2 or greater, the diagnosis of CKD requires the presence of other kidney damage e.g. persistent proteinuria (albumin-creatinine ratio >30 mg/mmol), persistent non-visible (microscopic) haematuria or structural kidney disease e.g. polycystic kidney disease.
- In Northern Ireland, laboratories do not routinely report eGFR ≥60mL/min/1.73m^2. Thus, CKD stages 1 and 2 would require urinalysis or renal imaging to allow CKD definition.

Table 2: Categories of Chronic Kidney Disease Based on Glomerular Filtration Rate

GFR category	GFR (mL/min/1.73m^2)
G1	>90
G2	60-89
G3a	45-59
G3B	30-44
G4	15-29
G5	<15

Table 3: Categories of Chronic Kidney Disease Based on Albuminuria

ACR category	ACR (mg/mmol)
A1	<3
A2	3-30
A3	>30

What Causes CKD?

- Specific causes include conditions such as diabetes, atheromatous renal vascular disease, glomerulonephritis, pyelonephritis and polycystic kidney disease.
- For many persons, no specific cause is identified and the CKD is presumed to be related to hypertensive or ischaemic kidney damage (both of which become more common with advancing age).

Who Should I Screen for CKD?

- Offer testing for CKD using eGFR and ACR to people with the following risk factors:
    - Diabetes
    - Hypertension
    - Cardiovascular disease (ischaemic heart disease, heart failure, peripheral vascular disease or cerebral vascular disease)
    - Structural renal tract disease, recurrent renal calculi or prostatic hypertrophy
    - Multisystem diseases that may impact on kidney function (i.e. SLE, rheumatoid arthritis, sarcoidosis)
    - Family history of end-stage renal disease or hereditary kidney disease
    - Monitor people for the development of CKD for two years after AKI, especially if the serum creatinine has not returned to baseline.
    - Opportunistic detection of haematuria
- Monitor GFR at least annually in people prescribed drugs known to be nephrotoxic (for example, ciclosporin or tacrolimus, lithium and NSAIDs)

What Baseline Investigations Should I Do in CKD?

- In patients with newly identified reduced eGFR (i.e. <60 mL/min/1.73m^2), the first step is to exclude acute kidney injury. Review of previous serum creatinine tests may allow confirmation that this is chronic kidney disease. Otherwise the patient should have a repeat serum creatinine (eGFR) within one week if normal electrolytes or within 48 hours if abnormal electrolytes (e.g. hyperkalaemia).

- If possible, patients should be advised not to eat any red meat 12 hrs before their blood test as the serum creatinine may be artificially elevated resulting in an erroneously lower eGFR. In practice a morning blood sample avoids this issue rapidly declining kidney function (over days to weeks) is acute kidney injury and urgent referral for assessment is advised.
- In all newly identified CKD patients the following should be checked at the earliest opportunity:
    - electrolytes
    - blood pressure
    - dipstick urinalysis
    - random urine albumin-creatinine ratio or urine protein-creatinine ratio
    - glucose, cholesterol and full blood count.

How Do I Test for Proteinuria/Albuminuria?

- Reagent strips for dipstick urinalysis provide a simple screening test but are not an accurate method of quantifying proteinuria. Reagent strips cannot detect low concentrations of albumin in the urine.
- Use a random urine albumin-creatinine ratio (ACR) to detect albuminuria in persons with diabetes and individuals without diabetes who have an eGFR < 60 mL/min/1.73m^2
- The urine ACR result may be normal (< 3 mg/mmol).
- If the ACR is between 3 mg/mmol and 70 mg/mmol, this should be confirmed by a subsequent early morning sample. This is because patients may exhibit transient microalbuminuria without any clinical significance. However if the initial ACR is 70 mg/mmol or more a repeat confirmatory sample is not needed
- Use urine ACR in preference to protein:creatinine ratio (PCR) as ACR has greater sensitivity for low levels of proteinuriaFor quantification and monitoring of high levels of proteinuria (ACR >70 mg/mmol) PCR can be used as an alternative.
- Progression of CKD (decline in eGFR) and cardiovascular events are more common if albuminuria (or proteinuria) is present.

Approximate Equivalent Values of ACR, PCR and Urinary Protein Excretion

ACR (mg/mmol)	PCR (mg/mmol)	Urinary Protein Excretion (g/24h)
30	50	0.5
70	100	1

What should I do if haematuria is present?

Asymptomatic non-visible haematuria is a very common in general practice with a prevalence of 2 - 13% in screened individuals.

There is currently no evidence to justify screening of the general population.

Excellent short clinical guidelines on assessment of haematuria were published by the British Association of Urological Surgeons and Renal Association and should be read in association with the summary in this GAIN document (see Appendix). In addition, a recent BMJ Practice Review provides concise guidance of assessment of asymptomatic non-visible haematuria (see Appendix)

The causes of haematuria vary with clinical presentation and age and in many such patients, particularly young adults, haematuria is transient and may be of no consequence.

The most common causes are urological such as kidney or urinary tract malignancy, stones, inflammation, infection or hyperplasia of the prostate or bladder. Only 10% of patients with haematuria will have a renal parenchymal cause. In up to 60% no diagnosis will be found despite complete assessment.

The following steps should be taken in the assessment of patients with haematuria:

1. **Urinary tract infection -** should be excluded by absence of nitrite and leucocyte on dipstick **and** negative MSU. Urinalysis should be repeated following treatment of a UTI to ensure haematuria is not persistent.

2. **History/Examination –** are there any findings that suggest a particular diagnosis?

3. **Investigations -** serum creatinine / eGFR, urinary ACR, bone profile, CRP, haemoglobin

4. **Referral criteria -** Referral for urological evaluation including renal imaging and cystoscopy is required in all patients with significant haematuria as defined by:

    a) Any single episode of **Visible Haematuria**, otherwise known as macroscopic or gross haematuria, at any age.
    b) **Non-Visible Haematuria,** otherwise referred to as microscopic or dipstick positive haematuria, is significant if a single episode is symptomatic at any age (hesitancy, frequency, urgency, dysuria) or if it is persistent (defined as two out of three dipsticks positive) and aged over 40.

If a urological cause is excluded a nephrology referral should be considered if the patient meets any of the CKD criteria for referral or has:

- Significant proteinuria (ACR ≥30mg/mmol or PCR ≥50mg/mmol =0.5g/24hr)
- Evidence of progressive CKD
    - a sustained decrease in eGFR of 25% or more and a change in GFR category within 12 months or
    - a sustained decrease in eGFR of 15mL/min/1.73m^2 per year
- Stage 4 or 5 CKD (eGFR <30mL/min/1.73m^2)
- Isolated haematuria (i.e. in the absence of significant proteinuria) with hypertension in those aged <40.
- Visible haematuria coinciding with intercurrent (usually upper respiratory tract) infection

In the event the above criteria are not met, haematuria itself (visible or non-visible) does not require nephrology referral.

When Should a Kidney Ultrasound be Performed in Persons with CKD?

A kidney ultrasound is recommended for persons with CKD who:

- have progressive CKD
- have visible or non-visible haematuria
- have symptoms of urinary tract obstruction
- have a family history of polycystic kidney disease and are aged over 20 years
- have stage 4 or 5 CKD

Which CKD Patients Should I Consider Referring to the Renal Service?

1. General points

- Take into account the individual's wishes and co-morbidities when considering referral to a specialist.
- Some individuals with advanced CKD (and their families) would not wish to consider renal replacement therapy e.g. dialysis and therefore referral may not be appropriate
- Consider discussing management issues with a specialist (virtual referral) where it may not be necessary for a patient to attend for hospital-based assessment
- Patients who seem too frail for dialysis may still be discussed as there are some non-dialytic management options. The risk of AKI can still be reduced in these frailer patients by avoiding nephrotoxic drugs and early treatment of inter-current illness.

2. Based on eGFR

- Patients with new **CKD 5 (eGFR <15 mL/min/1.73m^2)** should be discussed **immediately**
- Patients with new **CKD 4 (eGFR 15-29 mL/min/1.73m^2)** - **refer or discuss**
- Patients with **progression of CKD confirmed on repeat testing**
    - a sustained decrease in eGFR of 25% or more and a change in eGFR category within 12 months or
    - a sustained decrease in GFR of 15mL/min/1.73m^2 per year - refer **routinely**

3. Based on Proteinuria

- Patients with an **ACR or PCR >300 mg/mmol** and/or the nephrotic syndrome should be referred **urgently**
- Patients with an **ACR or PCR 100-300 mg/mmol** - refer **routinely**
- Patients with an **ACR or PCR 30-100 mg/mmol AND haematuria** – refer **routinely**

Clinical judgement may suggest other patients who should be referred, or a different degree of urgency.

4. Based on Blood Pressure

- Patients **with eGFR <60 mL/min/1.73m^2 + inadequately controlled blood pressure** despite 2-3 antihypertensive agents should be referred **routinely**
- Suspected renal artery stenosis

5. Known or suspected rare or genetic causes of CKD

Treatment

What Treatments are Appropriate for CKD?

General Points

- Review existing medication. Avoid chronic NSAIDs use; extreme care with short term use. Adjust other medication dose(s) according to eGFR using Appendix 3 in BNF.
- Advise lifestyle changes as appropriate: smoking cessation, reduction of obesity, increased exercise and reduce dietary salt intake to < 6 grams/day.

Hypertension

- Treat blood pressure ideally to <140/90 mmHg. Multiple agents may be required and the threshold for starting treatment is 140/90 mmHg
- If urine albumin-creatinine ratio ≥70 mg/mmol treat blood pressure ideally to <130/80 mmHg. ACEi/ARBs are first choice therapy.
- Offer an ACEi or ARB to people with CKD and
    - Diabetes and an ACR of 3 mg/mmol or more
    - Hypertension and an ACR of 30 mg/mmol or more
    - An ACR of 70 mg/mmol or more
    - Do **not** use a combination of ACEi and ARB
- Serum creatinine/eGFR should be checked 7-10 days after starting, or increasing the dose of an **ACEi or ARB**. These drugs may cause a rise in serum creatinine or fall in eGFR. If serum creatinine increase is >25% or eGFR decrease is < 25% from baseline, repeat the test in one to two weeks. If no further change then the current dose can be tolerated.
- Stop ACEi or ARBs if the serum potassium increases to 6 mmol/L or more. In such cases, instigation of a low potassium diet and cessation of other drugs which promote hyperkalaemia may allow reintroduction of ACEi or ARBs.

Statins

- Do not use a risk assessment tool to assess cardiovascular disease (CVD) risk in people with a GFR < 60 mL/min/1.73m^2 as these persons are at increased risk of CVD.
- Offer atorvastatin 20mg for the primary or secondary prevention of CVD especially to people aged over 40 with CKD.
- Increase the dose if a greater than 40% reduction in non-HDL cholesterol is not met.

Oral Antiplatelets and Anticoagulants

- Consider anti-platelet agents for the secondary prevention of **cardiovascular disease**
- Consider apixabab in preference to warfarin in people with an eGFR in the range 20 – 50 mL/min/1.73m^2 and non-valvular atrial fibrillation who have one or more of the following risk factors; prior stroke or transient ischaemic attack, age 75 or older, hypertension, diabetes mellitus, symptomatic heart failure.

Bone Metabolism and Osteoporosis

- Offer bisphosphonates if indicated for the prevention and treatment of osteoporosis in people with an eGFR $\geq$30 mL/min/1.73m^2
- Offer colecalciferol to people with CKD who have been identified to have vitamin D deficiency

A Note of Caution: Decline in GFR with age is incompletely understood at present and there is a need to refine and validate the eGFR equation especially when considering elderly patients (> 70 yr) with low eGFR.

The CKD classification system will identify many elderly subjects with low eGFR who do not have "true" kidney disease (as defined by steadily progressive kidney failure in association with other abnormal features such as proteinuria). Most CKD in the elderly is due to the cumulative effect of other disease states, especially hypertension and

atherosclerosis. It is important not to unduly alarm elderly patients with a misplaced diagnosis of advanced kidney failure.

How Should I Monitor Non-Referred CKD?

A majority of patients with CKD do not need to be referred and are well managed in primary care. A CKD register should be established for CKD stages 3, 4 and 5 to allow re-call arrangements. This would include patients with mild proteinuria (ACR 30-70 mg/mmol, isolated non-visible haematuria (after assessment by urology if appropriate see RA/BAUS guidelines 2008) and stable CKD 3 or 4. Suggested monitoring for these patients depending on their eGFR stage and ACR level and some of the associated targets is summarised in Table 4.

The frequency of eGFR monitoring should be tailored to changes to their treatments (such as change in dose of ACEi/ARBs, diuretics, NSAIDs), intercurrent illness and whether they have chosen conservative management of their CKD.

What About a Rise in Serum Creatinine or a Fall in Egfr?

- Large rises in serum creatinine (>30%) and the corresponding falls in eGFR are associated with inter-current acute illness particularly in the frail elderly population. There is often underlying vascular disease; diabetes and heart failure with the associated treatments. A falling eGFR will require closer monitoring.
- A sustained fall in eGFR (reduction of >15 mL/min/1.73m^2) should be confirmed by repeating serum creatinine/eGFR within one month.
- Progressive CKD is usually defined by at least three eGFRs over at least 90 days
- Many CKD patients exhibit minor fluctuations in their serum creatinine/eGFR (often linked to diuretic / ACEi therapy or inter-current illness).
- Temporary cessation of ACEi or ARBs can often correct these changes if the patient is at risk of dehydration.
- Chronic use of **NSAIDs** may be associated with progressive CKD; use with caution and ideally for only for short term.
- Drugs which contain **trimethoprim** can also result in a marked increase in serum creatinine without directly affecting kidney function. The serum creatinine should be repeated to obtain a more accurate serum creatinine (and eGFR) 48hrs after trimethoprim containing medications are stopped.

- Patients with CKD should be referred if they have a SUSTAINED decrease in eGFR of 15mL/min/1.73m^2 per year.

Urgency of Referral to a Nephrology Service

All nephrology services should offer 24 hour telephone access to qualified advice. A guide to referral urgency is below:

Immediate

- Suspected AKI
- AKI superimposed on CKD
- Newly detected stage 5 CKD (eGFR < 15 mL/min/1.73 m^2)
- Accelerated or malignant phase hypertension with suspicion of underlying kidney disease (or if there is no specialist hypertension service available locally)
- Hyperkalaemia, serum potassium ≥ 7.0 mmol/L

Urgent Outpatient

- Nephrotic syndrome
- Newly detected stage 4 CKD (unless known to be stable) or stable stage 5 CKD
- Multisystem disease (e.g. SLE, systemic vasculitis) with evidence of kidney disease
- Hyperkalaemia, serum potassium 6.0- 6.9 mmol/L (after exclusion of artefactual and treatable causes

Routine Outpatient

- Refractory hypertension (defined as sustained BP >160/90 mm Hg despite combination therapy with three drugs from complementary classes).
- Acute deterioration in kidney function (defined as a fall in eGFR of >25% or rise of serum creatinine concentration of >30% from baseline) associated with use of ACEi or ARBs
- Proteinuria (urine protein:creatinine ratio >70 mg/mmol) without nephrotic syndrome.
- Proteinuria with haematuria
- Stage 3 CKD with haematuria

- Urologically unexplained visible (macroscopic) haematuria (with or without proteinuria).

- Stable stage 4 CKD

GP care +/- "virtual" nephrology support/advice

- Stable CKD stages 1, 2 and 3
- Isolated non-visible (microscopic) haematuria (after negative urological evaluation)
- Isolated microalbuminuria in diabetes (albumin: creatinine ratio < 30mg/mmol)

Valuable Information to Include With a Hospital Referral

- General medical history - particularly noting urinary symptoms, previous blood pressures, urine testing.
- Information on the patient's functional status and cognitive function is especially relevant if dialysis is being considered as a treatment option.
- Medication history.
- Examination e.g. blood pressure, presence of oedema, vascular disease findings.
- Urine dipstick result - and quantitation of dipstick positive proteinuria by urine albumin/creatinine ratio or protein/creatinine ratio.
- Blood tests - Full blood count, urea and electrolytes, calcium, albumin, phosphate, cholesterol. HbA1c (in diabetes).
- Previous tests of renal function with dates.
- Imaging: - results of renal imaging if undertaken (according to local circumstances, pre-ordering may speed assessment).

Patient Involvement in CKD

- If CKD is identified offer people education and information tailored to:
    - establishing the cause of CKD
    - severity of CKD and risk of progression
    - monitoring
    - treatments and need for Nephrology referral
- Support self-management:
    - blood pressure, smoking cessation, exercise, diet and medicines
    - access to their medical data to encourage self-management of their CKD

Where Can I Get More Information?

- **https://www.nice.org.uk/guidance/cg182**
  Chronic kidney disease: early identification and management of chronic kidney disease in adults in primary and secondary care National Institute for Health and Clinical Excellence (2014)

- **www.renal.org/eGFR**
  Renal Association website quick access to info about eGFR and CKD stages with links to management.

- **http://renux.demed.ed.ac.uk/EdREN/index.html**
  Website of the Edinburgh Renal Unit with may helpful articles on kidney disease that are suitable for both health care professionals and patients.

- **http://www.renal.org/pages/media/Guidelines/RA-BAUS%20Haematuria%20consensus%20guidelines%20July%202008.pdf**
  British Association of Urological Surgeons / Renal Association: Initial assessment of haematuria.

- Investigating asymptomatic invisible haematuria. BMJ Practice Review. BMJ 2014; 349:g6768

Access to these guidelines and any future updates

https://www.rqia.org.uk/what-we-do/gain/gain-guidelines/2015-16/

The GAIN section of the RQIA website also displays other topic guidelines with relevance to the management of chronic kidney disease. These include:

- Acute Kidney Injury Guidelines (GAIN 2014)
- Hyperkalaemia guidelines (GAIN 2014)

Appendix 2

For further advice on Chronic Kidney Disease contact your local Nephrologist

Name	Telephone	Email
Altnagelvin and Tyrone County Hospitals		
Dr S Bolton	(028) 7134 5171	stephanie.bolton@westerntrust.hscni.net
Dr M Elawad	(028) 7134 5171	mamoun.elawad@westerntrust.hscni.net
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Appendix 3

Table 4: Suggested Monitoring of Chronic Kidney Disease in General Practice

STAGE	G1	G2	G3a	G3b	G4	G5
U&E and ACR (per year)	A1-3: once		A1-2: once	A1-2: once A3: twice	A1-2: twice A3: three times	≥4 times
Treatment	• Treat BP to a target of < 140/90 mmHg (130/80 if urine ACR ≥ 70 mmol/mol) • ACEi or ARB ONLY if -ACR ≥ 3 mg/mmol & diabetes -ACR ≥ 30 mg/mmol &BP ≥ 140/90 -ACR ≥ 70 mg/mmol • Consider a statin + aspirin 75mg for secondary prevention • Advise lifestyle changes as appropriate					
Referral	Progressive CKD Decrease GFR of ≥ 15mL/min/1.73m^2 over 12 months ± urine ACR ≥ 70 mg/mmol ± systolic BP ≥ 160 mmHg (despite treatment with multiple agents)				Discussion with or referral to renal unit is usual	Usually automatic (unless not for active treatment based on comorbidity)

Appendix 4

Abbreviations

ACEi	angiotensin converting enzyme inhibitor
ACR	urine albumin/creatinine ratio
AKI	acute kidney injury
ARB	angiotensin-II receptor blocker
CKD	chronic kidney disease
CVD	cardiovascular disease
eGFR	estimated glomerular filtration rate
ESRD	end-stage renal disease
NSAIDs	non-steroidal anti-inflammatory drugs
PCR	urine protein/creatinine ratio

Appendix 5

Membership of GAIN CKD Guideline Development Group

The Northern Ireland Guidelines for the Management of Chronic Kidney Disease (CKD): Practical Points for use of estimated GFR and albuminuria (ACR) in assessing CKD were developed by:

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The Chronic Kidney Disease guideline was Peer Reviewed by the members of the Northern Ireland Regional Nephrology Forum and NI Kidney Patients Association.

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