eGFR: National Renal Strategy and the Implications for Laboratories

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Chair, National Renal Strategy Review

Incidence of ESKD

	Incidence Rate
Greece	195
Austria	159
Catalonia (Spain)	138
Denmark	133
Sweden	122
Scotland	115
Metropolitan Cork[15] (n=250,000)	**112**
Netherlands	105
England & Wales	101
Finland	94
Counties Cork & Kerry[15] *(includes Metropolitan Cork)* (n=580,000)	**81**

Currently, about 320-360 Irish patients develop ESKD each year.

Prevalence of ESKD

	HD	PD	TX	Total
Catalonia (Spain)	529 (50%)	31 (3%)	504 (47%)	1064
Greece	684 (74%)	71 (8%)	168 (18%)	922
Austria	408 (47%)	33 (4%)	417 (49%)	858
Sweden	291 (36%)	84 (11%)	425 (53%)	801
Denmark	349 (46%)	115 (15%)	302 (39%)	768
Ireland (2005) [13]	**292(40%)**	**50 (7%)**	**384 (53%)**	**727**
Scotland	297 (41%)	81 (11%)	348 (48%)	725
Netherlands	242 (34%)	83 (12%)	379 (54%)	704
Finland	218 (32%)	58 (8%)	410 (60%)	685
Ireland (2004) [13]	**249 (38%)**	**54 (8%)**	**352 (54%)**	**656**
England & Wales	277 (43%)	88 (14%)	280 (43%)	645

Currently, about 3000 Irish patients have ESKD.
Just over half of these have a functioning renal transplant.
ESKD prevalence was 727 p.m.p. at end 2005.
This is lower than in most other European countries.

ESKD

CKD 4

CKD 1-3

Normal

Pyramid of Kidney Function

Differences.............

O'Donoghue, DJ, et al. Evaluating the Prevalence of Chronic Kidney Disease in the UK Using GP Computerised Records.
Abstract, RA Spring Meeting April 2004

- NeoErica project: 112,215 patients (12 practices)
- [Creat] in last 10 years - 27.4% – 74% in last 2 years
- Proteinuria recorded in 9.1%
- 24.9% had eCrClr <60ml/min (C&G)
- At least 5.1% of UK population CKD 3-5
- (NHANES-III 4.7% of US population CKD 3-5)

RoI –personal guess – up to 4%

5 Key data points

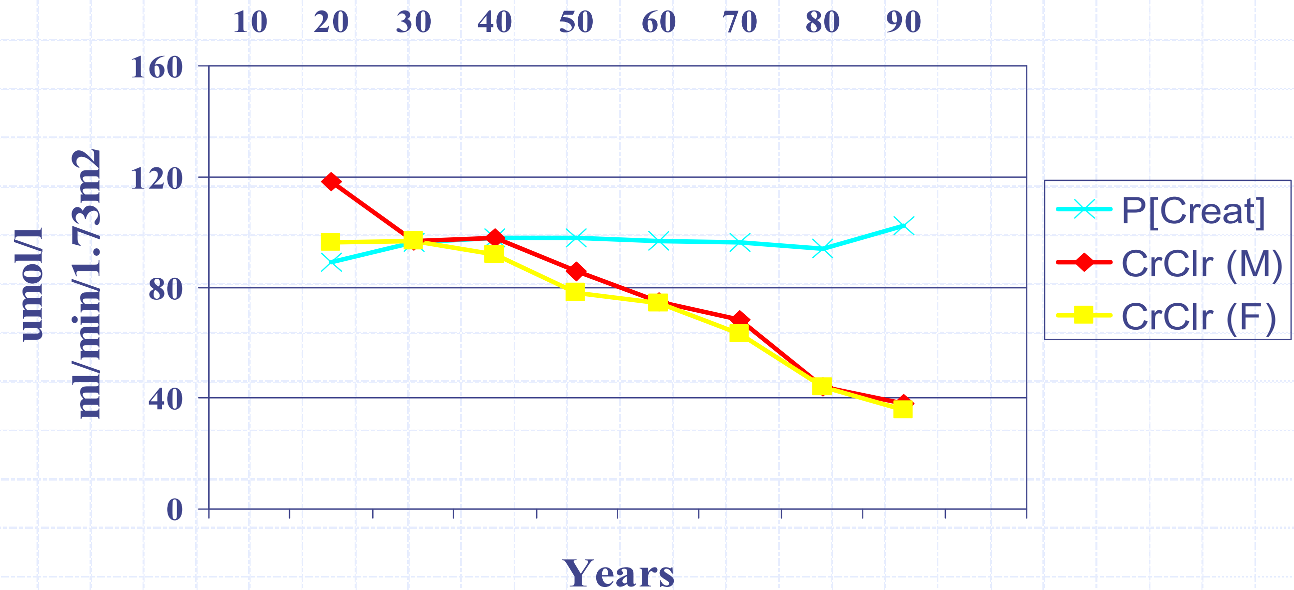
1. Stage of CKD
   - GFR
   - Hypertension
   - Proteinuria
2. Complications
3. Rate of Progression
4. Comorbidities
5. Cause of CKD

K/DOQI Stratification

Stage	GFR (ml/min/1.73m2)	Comment
1*	>90	Hypertension Structural problem
2*	60-89	Hypertension Structural problem
3	30-59	Complications Progression/Referral
4	15-29	More Complications Referral/Preparation
5	0-14	RRT/Conservative

Plasma [Creat] & Creatinine Clearance

(Kampmann et al. 1974)



Level of Renal Function

Cockcroft & Gault

Est. Creatinine Clearance (ml/min)

Age, Weight, Gender, [Creat]

www.nephron.com/cgi-bin/CGSIdefault.cgi

Abbreviated MDRD

Est. Glomerular Filtration Rate ($ml/min/1.73m^2$)

Age, Gender, Race, [Creat]

www.nephron.com/cgi-bin/MDRD_GFR.cgi

http://renal.org/eGFR/eguide.html

The short CKD eGuide, derived from the UK CKD Guidelines (2005)

from the UK CKD guidelines on the Renal Association website

Patient information

This page gives only titles of pages with more detailed information elsewhere in the CKD eGuide.

The **short CKD eGuide** is adapted from the full UK Chronic Kidney Disease Guidelines in order to provide rapid online support for the diagnosis and management of chronic kidney disease in the community and elsewhere. The following table lists all the pages in the eGuide. You can also download a concise guide for printing.

Pages of the eGuide				
eGuide home	**CKD stages**	**Deteriorating function**	Cardiovascular risk	**Referral indicators and urgency**
eGFR calculator	Management of stages 1+2	Haematuria	Hypertension	What to send
about eGFR	Management of stage 3	Proteinuria	Anaemia	Normal GFR
Full CKD guide home	Management of stages 4+5	Microalbuminuria	Calcium, phosphate, PTH	eGFR intro

UK CKD guidelines desktop guide consultation draft

White men Creatinine	Age 20	30	40	50	60	70	80
70	>90	>90	>90	>90	>90	>90	>90
80	>90	>90	>90	>90	>90	88	86
90	>90	>90	86	82	79	77	75
100	88	81	76	73	70	68	66
110	79	72	68	65	63	61	59
120	71	66	62	59	57	55	54
130	65	60	56	54	52	50	49
140	60	55	52	49	48	46	45
150	55	51	48	46	44	43	42
160	51	47	44	42	41	40	39
170	48	44	41	40	38	37	36
180	45	41	39	37	36	35	34
190	42	39	36	35	34	32	32
200	39	36	34	33	32	31	30
210	37	34	32	31	30	29	28
220	35	33	31	29	28	27	27
230	34	31	29	28	27	26	25
240	32	29	28	27	26	25	24
250	31	28	27	25	24	24	23
260	29	27	25	24	23	23	22
270	28	26	24	23	22	22	21
280	27	25	23	22	21	21	20
290	26	24	22	21	21	20	19
300	25	23	21	21	20	19	19
310	24	22	21	20	19	18	18
320	23	21	20	19	18	18	17
330	22	20	19	18	18	17	17
340	21	20	19	18	17	17	16
350	21	19	18	17	17	16	16
360	20	18	17	17	16	16	15
370	19	18	17	16	16	15	15
380	19	17	16	16	15	15	14
390	18	17	16	15	15	14	14
400	18	16	15	15	14	14	13
410	17	16	15	14	14	13	13
420	17	15	15	14	13	13	13
430	16	15	14	14	13	13	12
440	16	15	14	13	13	12	12
450	15	14	13	13	12	12	12
460	15	14	13	13	12	12	11
470	15	14	13	12	12	11	11
480	14	13	12	12	11	11	11

UK CKD guidelines desktop guide consultation draft

UK CKD guidelines desktop guide consultation draft

White Women Creatinine	Age 20	30	40	50	60	70	80
70	>90	>90	>90	>90	>90	>90	>90
80	>90	>90	>90	>90	>90	65	64
90	>90	>90	64	61	59	57	56
100	65	60	57	54	52	51	49
110	58	54	51	48	47	45	44
120	53	49	46	44	42	41	40
130	48	44	42	40	39	37	36
140	44	41	38	37	35	34	33
150	41	38	35	34	33	32	31
160	38	35	33	31	30	29	29
170	35	33	31	29	28	27	27
180	33	30	29	27	26	26	25
190	31	29	27	26	25	24	23
200	29	27	25	24	23	23	22
210	28	25	24	23	22	21	21
220	26	24	23	22	21	20	20
230	25	23	22	21	20	19	19
240	24	22	21	20	19	18	18
250	23	21	20	19	18	18	17
260	22	20	19	18	17	17	16
270	21	19	18	17	17	16	16
280	20	18	17	16	16	15	15
290	19	18	17	16	15	15	14
300	18	17	16	15	15	14	14
310	18	16	15	15	14	14	13
320	17	16	15	14	14	13	13
330	16	15	14	14	13	13	12
340	16	15	14	13	13	12	12
350	15	14	13	13	12	12	12
360	15	14	13	12	12	12	11
370	14	13	13	12	12	11	11

GUIDELINES FOR

CHRONIC KIDNEY DISEASE

IN NORTHERN IRELAND

K/DOQI Stratification

Stage	GFR (ml/min/1.73m2)	Comment
1*	>90	Hypertension Structural problem
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Proteinuria

- Dipstick for Screening
- 24hr collection if nothing better (worse!) to do

- Protein/Creatinine or Albumin/Creatinine ratios
- Express as <u>mg/mmol</u> (x0.0088 for 24h)

<3.0	Normal
3.0 – 34.0	Microalbuminuria
>34.0	Proteinuria

Example 1

Male, 72 yr, Type II DM		Description
[Creat]	210umol/l	**CKD:** Stage 3-4/5
$U_{[Protein]}$	1405mg/l	**estGFR:** 30ml/min/1.73m^2
$U_{[Creatinine]}$	6200µmol/l	**Protein/Creatinine:** 227
		estProteinuria: 2 g/day/1.73m^2
BP	142/96	

Example 2

Female, 66 yr, ADPKD

[Creat]	188umol/l
$U_{[Protein]}$	305mg/l
$U_{[Creatinine]}$	9400μmol/l
BP	149/78

Description

CKD:

Stage 4/5

estGFR:

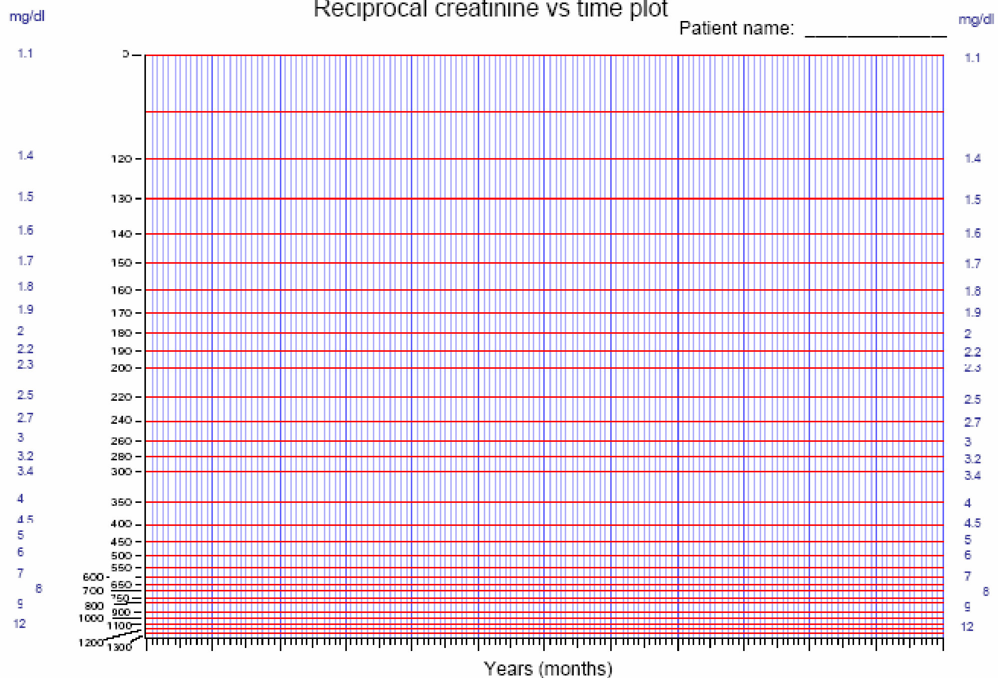
26ml/min/1.73m^2

Protein/Creatinine:

32

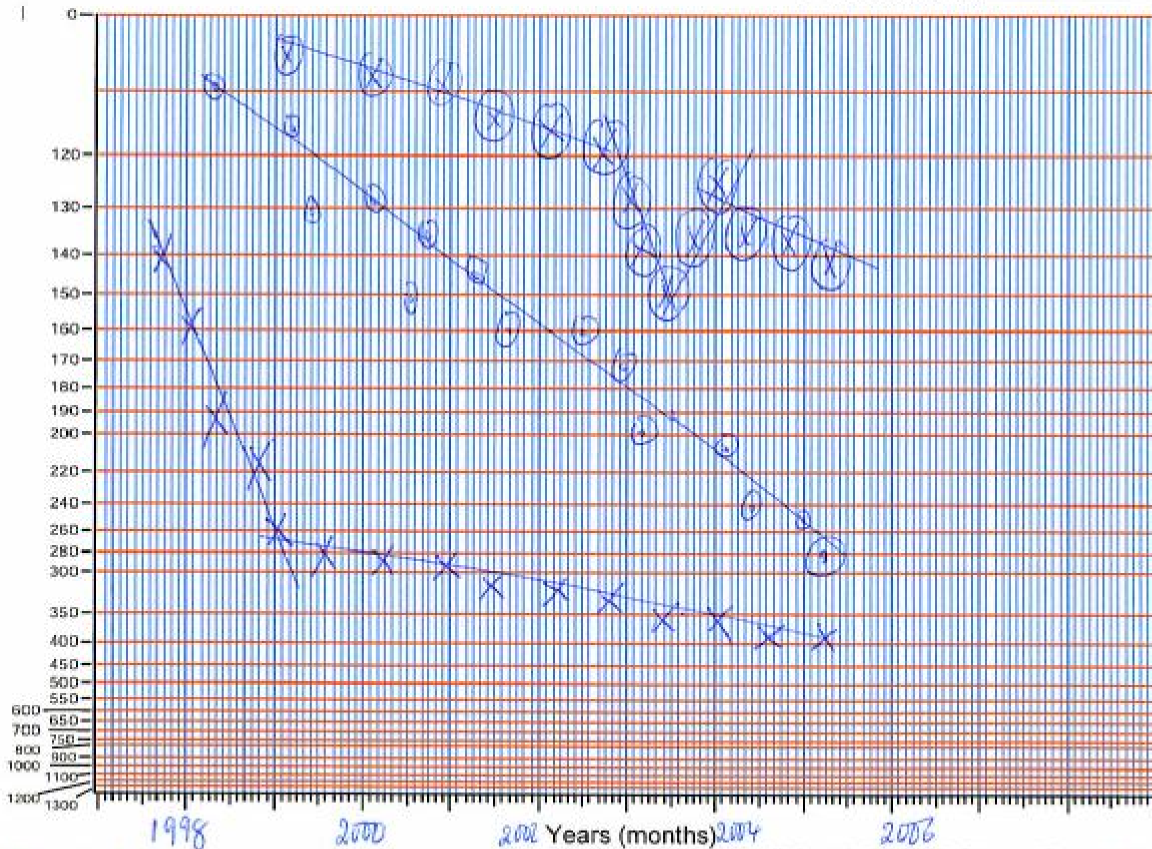
estProteinuria:

0.28 g/day/1.73m^2



Downloadable from www.edren.org

Edinburgh Royal Infirmary Renal Unit



Reciprocal creatinine vs time plot
Patient name:
Years (months)
0
120
130
140
150
160
170
180
190
200
220
240
260
280
300
350
400
450
500
550
600
650
700
750
800
1000
1100
1200
1300

MANAGEMENT OF CHRONIC KIDNEY DISEASE (Summary Table)

A diagnosis of CKD should not be made on the basis of a single biochemistry value, or an acute rise in serum creatinine. Likewise if a patient is unwell they should be referred/discussed urgently.

STAGE	1	2	3	4	5
eGFR mls/min	≥ 90 + albuminuria or haematuria	60 - 89 + albuminuria or haematuria	30 - 59	15 - 29	<15
Tests	Annual U+E (including eGFR) Annual urine ACR			As before but now 6 monthly	Check U+E 3 monthly
Treatment	• Treat BP to a target of < 130/80 (threshold to treat is 140/90) • ACEi or ARB if urine ACR > 3mg/mmol (i.e. microalbuminuria) in diabetes • ACEi or ARB if urine ACR ≥ 30mg/mmol (i.e. proteinuria) in other patients • Statin if CVD risk ≥ 20% over 10 years • Aspirin 75mg (if no contraindication) • Advise lifestyle changes as appropriate				
Referral	Fall in eGFR by > 15% per year Rise in serum creatinine > 20% per year ± Urine ACR ≥ 100 ± Systolic BP ≥ 160 (despite treatment with multiple agents)			Discussion with or referral to renal unit is usual	Usually automatic (Unless not for active treatment based co-morbidity)

Conclusion

- Paradigm of the past
  late identification of single target organ damage
  conspiracy of 'minimisation'
  focus on 'strange' end-stage strategies
  failure to identify early stages of renal disease
  failure to target these stages

- Paradigm of the future
  a chimera
  Public Health & General Practice
  patient-centred approach