Mr Chairman, ladies and gentlemen, I’d like to thank the ERA-EDTA for the invitation to speak today. After the elegant descriptions of the mechanisms and cellular events in AKI that we’ve just heard from Professor Lameire, what I’m going to talk about really is probably common sense to a lot of people here but as we’ll hear, it may not be common sense and second nature to the sort of people who deal with AKI which on the whole are non-nephrologists.
So, the topic I was given was ‘AKI detection as an opportunity to prevent CKD’.

slide 3

Acute Kidney Injury (AKI) in the UK

- Significant, previously under-addressed problem

- 13-18% of hospital admissions
  - Increased in the elderly population
- Usually under the care of non-nephrologists

- Costs £434-620m per annum (0.5% of NHS budget)
  - Not including community costs
- Mortality high – up to 30%

In the UK, AKI is a significant and previously under-addressed problem. It is known to occur in somewhere between 13-18% of hospital admissions and it’s increased in the elderly population as we know. As I mentioned, usually these patients are under the care of non-nephrologists. In the United Kingdom, AKI is estimated to cost somewhere around half a billion pounds, that’s around 0.5% of the NHS budget and that doesn’t include community costs once patients have left hospital. Mortality is high which can be up to 30%.
The UK Confidential Enquiry into patient deaths reports from 2009 looked at just under 600 patients who died in hospital with a diagnosis of AKI.

Overall, the assessment of care deemed by the reviewers was that in around 50% of patients care was good but particularly in those who developed AKI following admission rather than on arrival, the care was even less good. Perhaps that’s where interventions should be focused.
Furthermore, of the 107 patients who died, about 20% were felt to have a predictable and avoidable case of AKI.

In the UK, a number of centres including Derby and Truro have reported their incidence of AKI and mortality outcomes. Nick Selby’s group from Derby showed that patients with abnormal baseline creatinines with CKD had a poorer outcome in the right-hand panels with AKI stages 1, 2 and 3 with mortality higher than those with normal baseline creatinines.
Rob Parry and Katie Wallace’s group reported this year again that mortality increases as AKI stage worsens.

From AKI to CKD – how might it happen?

- Initial insult renders patient dialysis-dependent permanently
- Initial AKI recovers partially, leaving CKD
- AKI initially recovers to baseline, then slowly progressive CKD (at more accelerated rate than expected)

How might it happen? Well, we’ve already heard some of the mechanisms. It may be there’s an initial insult that renders the patient dialysis-dependent and they don’t recover from that insult at all. They may develop AKI that recovers partially and we’ve all seen that leaving CKD behind or it may be that there’s an apparent recovery in AKI with changes that we couldn’t detect with changes in serum creatinine. But then the patients develop slowly progressive CKD at a faster rate than might otherwise have been expected.
We've just seen some of the risk factors in the last talk for CKD progression after AKI and when we look at them compared to the risk factors for AKI in anyone admitted with an intercurrent illness, there's a lot of overlap between the two, particularly increasing age, diabetes, congestive cardiac failure, and those with pre-existing CKD. So, perhaps these are the patients we should be focusing on not just in early detection but also in follow-up to try and prevent a further episode of AKI.

### From AKI to CKD

<table>
<thead>
<tr>
<th>Risk factors for AKI</th>
<th>Risk factors for CKD progression after AKI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing age</td>
<td>Increasing age</td>
</tr>
<tr>
<td>Diabetes mellitus</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>Relative hypotension</td>
<td>Hypertension</td>
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<tr>
<td>Congestive cardiac failure</td>
<td>Congestive cardiac failure</td>
</tr>
<tr>
<td>Pre-existing CKD</td>
<td>Pre-existing CKD</td>
</tr>
<tr>
<td>Liver disease</td>
<td>Co-morbidity associated with AKI episode</td>
</tr>
<tr>
<td>Atherosclerotic peripheral vascular disease</td>
<td></td>
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<tr>
<td>Drugs affecting renal haemodynamics</td>
<td></td>
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</tbody>
</table>

From AKI to CKD

- 30% of patients with AKI have pre-existing CKD

- Very few (<10%) patients with AKI are followed-up

- If follow-up does occur, it often ends when creatinine stabilises

We know that about 30% of patients with AKI will have pre-existing CKD but very few patients, less than 10% in this study with AKI, are actually followed-up. It’s well-recognised that patients coming in for other problems such as elective surgery or a pneumonia who may develop AKI stages 1 or 2 during their admission it gets completely better, the nephrologists never know anything about it and it doesn’t necessarily, certainly in the UK and in our experience, appear on their discharge summary. A follow-up does occur and it often ends when the creatinine stabilises but as we’ve seen, these patients are at higher risk of further insults.

From AKI to CKD

- AKI (stages 1 & 2) in a cohort of peripheral artery surgery patients

<table>
<thead>
<tr>
<th></th>
<th>AKI group (n=21)</th>
<th>Without AKI (n=145)</th>
<th>OR (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Death at 1 year</td>
<td>33.3%</td>
<td>1.3%</td>
<td>35.7 (6.7 to 180)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>CVE at 1 year</td>
<td>88.1%</td>
<td>2.1%</td>
<td>29.1 (6.9 to 123.4)</td>
<td>&lt;0.003</td>
</tr>
</tbody>
</table>

OR, odds ratio; p was assessed using chi-square test.
CVE, cardiovascular events.

Adalbert D et al, *Ren Fail* 2013

- More CKD patients in AKI group than non-AKI group (23.8% vs 6.2%)

We know that having had AKI increases the risk of future vascular events. This group from Romania showed that the increased mortality and cardiovascular, cerebrovascular events at a year following peripheral artery surgery in patients who developed AKI stages 1 and 2 but there were more patients with CKD in the AKI group.
From AKI to CKD

- Following AKI, the risk of coronary events increases

This demonstrates and the blue line on the right panel, an increase in the rate of coronary events in patients who developed AKI and higher in those who are diabetic.

Is it CKD or illness causing poor AKI outcomes?

- All patients requiring RRT for AKI 1994-2005 (Glasgow)
- 396 patients
  - 176 ventilated (44%)
  - 98 had pre-existing CKD (25%)

Chris Isles’ group in Glasgow reported a couple of months their review of all patients from their unit who required renal replacement therapy just over 10 years, over 12 years up to 2005. Just under half of them were ventilated and about a quarter had pre-existing CKD.
Is it CKD or illness causing poor AKI outcomes?

- All patients requiring RRT for AKI 1994-2005 (Glasgow)
  - 396 patients
    - 176 ventilated (44%)
    - 98 had pre-existing CKD (25%)

- At 90 days
  - Ventilated patients had poorer outcome (survival OR 2.1)
  - Pre-existing CKD had no effect

- At 5 years
  - Ventilated patients no longer at increased risk
  - Pre-existing CKD
    - Increased risk of death (OR 6.05)
    - Strong predictor of future need for RRT

Now, at 90 days, those that were ventilated did less well and that’s well-recognised and pre-existing CKD seemed to have no effect. But at 5 years, the patients who were ventilated, if they survived, were no longer at increased risk but those with pre-existing CKD did far less well.

Is it CKD or illness causing poor AKI outcomes?

This was shown on the graph here. On the left-hand panel, those that were ventilated had a poorer survival but on the right-hand panel starting at 90 days the upper bar, those that were ventilated compared to those that were not ventilated.
Is it CKD or illness causing poor AKI outcomes?

Those who developed acute or chronic kidney disease didn't seem to have any difference at that point but those who developed acute and chronic kidney disease compared to not having CKD before their insult did less well after 90 days.

slide 19

AKI-on-CKD associated with poorer renal outcomes

We also know that overall there are poorer renal outcomes in patients who have had AKI and this overlaps with what we've already heard. This report from KI a couple of years ago looking at long-term dialysis dependence depending on whether they had pre-existing CKD or not after AKI or whether they recovered function or not with or without CKD.

slide 20
From AKI to CKD

- Meta-analysis of 13 cohort studies (Coca et al)
- Long-term renal and non-renal outcomes in AKI patients

Just to summarise the analysis, the report was that there was an independent risk factor of AKI for longer term CKD, ESRD and death. So here, we have the excess risk for CKD after AKI,
From AKI to CKD

![Figure 2b. Pooled Adjusted Hazard Ratios for ESRD after AKI](Coca SG et al. Kidney Int 2012)

the next slide for ESRD

slide 23

From AKI to CKD

![Figure 3. Pooled Adjusted Hazard Ratios for Mortality after AKI](Coca SG et al. Kidney Int 2012)

and the last slide for mortality.

slide 24
Is CKD under-recognised after severe illness?

- 700 cases of ICU admission for >5d

![Graph showing eGFR (ml/min/1.73m²) by eGFR Category](image)

It’s worth pointing out this group, John Prowle’s group in London that reported last month that patients who are very severely ill on the intensive care unit often lose muscle mass and due to a number of contributing factors may have a lower creatinine on discharge compared to their baseline. When that’s adjusted for their severe illness, it may be actually, that we’re missing quite a lot of patients with CKD after they leave the ICU.

slide 25

Reasons to act

- AKI is associated with poorer outcomes overall
- AKI is associated with long-term CKD
- AKI may have a causal role in CKD progression
- AKI is more common in those with known risk factors
  (perhaps especially those with pre-existing CKD)

So why do we need to do anything? Well, that should be common sense, AKI is associated with poor outcomes overall, it’s associated with long-term CKD, it may have a causal role in CKD progression and it’s more common in those with known risk factors, perhaps especially with those with pre-existing CKD.

slide 26
Reasons to act

- AKI is associated with poorer outcomes overall
- AKI is associated with long-term CKD
- AKI may have a causal role in CKD progression
- AKI is more common in those with known risk factors
  (perhaps especially those with pre-existing CKD)

- How can we do better?
- Is it so hard to do the basics well?

So how can we do better? How can all doctors and medical, staff, nursing staff in hospitals do better? Is it really so hard to do the basics well?

slide 27

AKI in Exeter

- Royal Devon & Exeter Hospital
  - Emergency and specialist care to 400,000 local residents
  - Tertiary services (including renal service) to up to 1,000,000 population
  - 100,000 Emergency Department attendances per year
  - 36,000 emergency medical and surgical admissions per year

Just a comment about where I’m from. I’m from the Royal Devon Exeter Hospital, it’s an emergency and specialist care hospital to about 400,000 local residents ad we have tertiary services including provision of renal services for up to a million population. There are around 100,000 emergency department attendances per year and around 36,000 emergency medical and surgical admissions per year. A large proportion of people who move to the southwest do so to retire, so it’s there’s also quite an elderly population. The age demographic of the southwest is currently at the position that the rest of the UK won’t reach for another 20 years. Actually, there’s a town here called Sidmouth, which is just between Exeter and the Dorset border, their age demographic now the rest of the country won’t reach until 2075. So there are an awful lot of elderly people in our catchment area.

slide 28
How much AKI is there in Exeter?

- Until 2012, we had no idea!
  - We knew how many patients we dialysed, but little else
  - Coding typically poor
  - Underreported

- Three challenges
  1. Discover incidence of AKI across the hospital
  2. Promote prompt action when e-alerts generated
  3. Introduce strategies to prevent AKI wherever possible

What we didn’t know until 2012 really was how much AKI there was. We knew how many patients we dialysed but very little else. As we mentioned, coding was typically poor and that’s something across the UK in terms of coding that is improving but has been less good and it’s been under reported. So we had three challenges really. We need to discover the incidence of AKI across the hospital, we need to promote prompt action when –e-alerts for AKI generated and we need to introduce strategies to try and prevent AKI wherever possible.

It’s topical the national Institute for Health and Care Excellence Guidelines for AKI were published in the UK in August of last year.
This on the same day is publication then generated press and public interest telling us how terrible we were at managing AKI.

The BBC caught on to it as well. One thing that they did say, which obviously is not right, is that AKI is almost entirely preventable. Obviously, we wouldn’t necessarily agree with that but there are a number of cases in which it is preventable.
A colleague pointed out to me just before I left for this meeting on Friday that if you put AKI into Google in the UK,

the top hit that you get back is from a group of solicitors arranging personal injury claims. So, it's clearly in the public's consciousness as well that we need to be addressing AKI particularly where it's preventable.
UK AKI Consensus Conference

- Royal College of Physicians, Edinburgh – November 2012
- Consensus statement produced
- Recommendations included
  - Advice on early risk factor assessment
  - Advice on medications to withhold
  - Need for development of e-alerts for AKI
  - E-alerts now in place in significant number of UK hospitals
  - Scientific day scheduled for 19th June in London to share best practice

There was a UK AKI Consensus Conference held at the Royal College of Physicians in Edinburgh in November 2012 and a statement was produced that is available online. There are a number of recommendations included particularly, on early risk assessment and we heard in Sunday’s session the importance of risk assessment in patients with AKI. The advice in the consensus statement was to withhold ACE inhibitors and ARBs in anyone coming in with an emergency non-elective admission, which is interesting considering the discussion we’ve just had. There was a recommendation that we needed to develop electronic alerts for AKI. Now, they’re now in place in a significant number of UK hospitals so I feel like I’m presenting on behalf of all of my colleagues in other centres who have put this in place and we’ve got a scientific day scheduled for later this month to share best practice and learn from each other in terms of how these are implemented.

Challenge 1 – how big was the problem?

- Automated e-alert for new cases of AKI (July 2012)
  - Algorithm using KDIGO definition for calculation
  - Lowest creatinine in previous 90 days used as baseline
  - E-alert highlights link to hospital intranet AKI guidelines
  - Validated
    - false positive rate of 1.5%
      - typically due to spurious baseline or advanced CKD
    - false negative rate of <0.5%
      - usually lack of baseline creatinine at admission
  - Allows generation of monthly reports on AKI incidence
    - Date / location / specialty

We looked at how big was the problem. That was our first challenge, so we put our automated electronic alert into our pathology system in July 2012. For the next few months it was refined, we eliminated dialysis patients, made sure we got the algorithm right and so by the end of that year, it was about right. What happens is whenever a creatinine is measured, the algorithm looks back for the lowest baseline within 90 days and then makes the judgement as to whether it’s risen by the KDIGO definitions for AKI stages 1, 2 and 3. This then flags up an electronic alert to the end user who’s looking at the results and then, there’s a link to intranet guidelines in the hospital. It allows us to generate monthly reports or even daily reports if we wanted to at a level of days, location, specialty, consultant and clinician.
So, this is the sort of thing that pops up on the screen after a creatinine is read. They scroll down and it says AKI stage 1 or whichever it is identified and this is the link to the intranet guidelines that we have.

We didn’t notice though in the first few months that two thirds of the AKI stage ones here were post-admission. So there’s clearly something that needs to be done to address those at risk when they come into hospital with AKI and try and prevent them from developing AKI.
Over all the last year, about half of the patients with AKI have come in through the front door. Blue is AKI stage 1, red is stage 2 and green is stage 3. But when we were looking at where our interventions were most needed for a pilot study of interventions,

it wasn’t surprising to see that we had the highest incidence of AKI in specialities, respiratory, GI surgery and elderly medicine where we had patients who were elderly, septic, often with multiple comorbidities and on antibiotics which are often nephrotoxic. So that was really the area where we were focusing on at that time.
In the last year how many cases have we had? Well, there have been just under 5,000 e-alert flags in about 4,600 patients, which represents about 14.3% of our emergency admissions. Now most of these, three quarters of these, are AKI stage 1. But then, there’s a spread of 10-12% between stages 2 and 3.

Patient outcomes

- Analysis of outcomes of AKI cases (April – July 2013)

<table>
<thead>
<tr>
<th>AKI stage</th>
<th>30-day mortality (median)</th>
<th>Median length of stay (if survived to discharge)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>14.8%</td>
<td>11 days</td>
</tr>
<tr>
<td>Stage 2</td>
<td>22.3%</td>
<td>12 days</td>
</tr>
<tr>
<td>Stage 3</td>
<td>28.3%</td>
<td>11 days</td>
</tr>
</tbody>
</table>

The outcomes of
Patient outcomes

- Analysis of outcomes of AKI cases (April – July 2013)

<table>
<thead>
<tr>
<th>AKI stage</th>
<th>All cases of AKI</th>
<th>Post-admission AKI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>30-day mortality (median)</td>
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</tr>
<tr>
<td>Stage 1</td>
<td>14.8% 11 days</td>
<td>13.7% 14 days</td>
</tr>
<tr>
<td>Stage 2</td>
<td>22.3% 12 days</td>
<td>21.4% 15 days</td>
</tr>
<tr>
<td>Stage 3</td>
<td>28.3% 11 days</td>
<td>33.3% 18 days</td>
</tr>
</tbody>
</table>

AKI stage 1, n=365 (68 post-admission AKI)
AKI stage 2, n=561 (70 post-admission AKI)
AKI stage 3, n=205 (93 post-admission AKI)

the first cohort that we looked at are relatively poor and this corresponds to data from Nick Selby’s group, from Rob Parry’s group in Cornwall and others that have published on this elsewhere around Europe and the world. As AKI stage increases, 30-day mortality is poorer and those who develop post-admission AKI seem to do even less well and were staying in hospital significantly longer. The median stay for a non-elective admission in our hospital if they don’t develop AKI is two days.

slide 43

Patient outcomes

- AKI stage 3 – Identified Nov 2012-Jan 2013

We also had a quick look at some of our outcomes from the first cohort when we were looking at these e-alerts. I just got this back in last week or so. So, it clearly needs little bit of refinement but it gives us an idea. There are 152 patients who had AKI stage 3 in that 3-month period. 64 of them died within 30 days; some of whom required renal replacement therapy. So we had 88 survivors over 30 days.

slide 44
We got down to about 80 patients to review. 4 patients remained on dialysis after 30 days and 4 we didn't have follow-up results for.

Now I have just split them up into those with a baseline creatinine of less than 60, 60-120 and 120-200 and over 200. As you’ll see in the bottom right panel, those who had an elevated serum creatinine to start with there’s a wide scatter as to how they got on and then there are some patients who also died after the one month follow-up period. Those with serum creatinines of 60-120, on the whole in this group, seemed to recover function largely to baseline. What’s interesting and probably worth another look at and as we get more data we’ll continue to do this and that is the benefit of having the alerts, it gives us that data source, is those patients who had very low creatinine to start with seem to have quite a wide scatter and quite a lot of them didn’t recover function. This may be because this is a more elderly population, more frail, less muscle mass or perhaps as many of the patients were, they had been in hospital for a very long time or were very malnourished or were from gastroenterology wards or with liver disease.
So, we need to look at this in more detail.

But we had a rise in creatinine at 12 months in that group which was more marked than the others.
Challenge 2 – promoting action on e-alerts

- Why was AKI being ignored?
  - Lack of understanding of problem or its consequences?
  - Fear?
    - Of doing the wrong thing (e.g. causing fluid overload / stopping drugs)
    - Of renal medicine??
      - “It’s all a bit complicated!!”
  - Lack of ‘supporting environment / structures’?

So, we found out how much AKI there was. We then thought, well what can we do about it in terms of promoting action on the alerts. Why was it being ignored? Was it a lack of understanding of the problem or of its consequences? Was it fear of doing the wrong thing? Was it fear of renal medicine? It’s all a little bit complicated some of the responses that we had. Was it we needed to put in a supporting structure?

Baseline knowledge is poor

Diagnosis and management of acute kidney injury: deficiencies in the knowledge base of non-specialist, trainee medical staff

Fifty percent of trainees could not define AKI, 30% could not name more than two risk factors for AKI and 37% could not name even one indication for renal referral. These serious gaps in knowledge highlight the need for enhanced education aimed at all training grades. Organisational changes may also be required to optimise patient safety.

We know that baseline knowledge amongst trainees in non-nephrology specialties is relatively poor. This is a study from a couple of years ago and it did highlight that these gaps in knowledge needed interventions at both education and organisational levels.
Anyone involved in medical education will know Miller’s pyramid and how we want to try and move junior trainees up this pyramid so that their competences improve as time goes by.

But also what
you need is some underpinning, they need to know about AKI, they need to have heard about it. That is required to underpin the higher levels of knowledge.

slide 53

So it’s all about education.

slide 54
So, what we’ve done in these last few months, in February of this year having recruited last year, we’ve introduced an AKI Outreach Education Team across the hospital. At the moment, in the pilot form focusing on those areas that I circled in the earlier graph where the highest incidence was.

**Challenge 2 – promoting action on e-alerts**

- **Why was AKI being ignored?**
  - Lack of understanding of problem or its consequences?
  - Fear?
    - Of doing the wrong thing (e.g. causing fluid overload / stopping drugs)
    - Of renal medicine??
    - “It’s all a bit complicated!”
  - Lack of ‘supporting environment / structures’?

- **Introduction of AKI Outreach Education Team (Feb 2014)**

So, what we’ve done in these last few months, in February of this year having recruited last year, we’ve introduced an AKI Outreach Education Team across the hospital. At the moment, in the pilot form focusing on those areas that I circled in the earlier graph where the highest incidence was.

**AKI Outreach Education**

- Multidisciplinary support and education
- ‘First-responder’ medical staff
  - Usually the most junior and inexperienced
- Registered and unregistered nurses
- Establishment of link nurses on all wards
- Link e-alerts to ward pharmacists

- Follow-up of high-risk patients
- Patient education

This gives us multidisciplinary support and education to the first responder medical staff who are often the most junior medical staff in the hospital straight out of medical school. To registered and unregistered nurses saying this is why you need to be interested in what the urine output is, this is why it is important. Establishing a network of link nurses on all wards and linking the alerts to the ward pharmacist so they know what is going on.
Then having a database of knowing who the high-risk patients are, so we can follow them up and then empowering the patients with patient education.

slide 57

Preventing, we have just heard preventing episodes of AKI getting any more serious. Well the intranet guidelines will take the junior doctor or whoever it is who sees it to this pathway so we can from an early stage identify the risk factors and correct anything that could be corrected very early on instead of waiting a few more days and just hope it gets better.

slide 58
Challenge 2 – promoting action on e-alerts

• Has introduction of e-alerts made a difference?
  • to numbers?

Has it made a difference? Well, the numbers have started to come down to a degree of all cases.

slide 59

Challenge 2 – promoting action on e-alerts

• Has introduction of e-alerts made a difference?
  • to AKI progression?

In terms of patients who have progressed through more than one stage of AKI, the trend is that that has started to come down but it has plateaued off a little bit. However, the introduction of the Outreach team was here and it may be that as time goes by, I hope in a year or two to be able to show you that that has continued to improve.

slide 60
The highest stage of AKI that patients reached seems to be more AKI 1 than AKI 2 and 3 although again, these are relatively small numbers, small changes at this point and I think the other interventions may have more difference.

Challenge 3 – AKI prevention strategies

- How can we change behaviour?
- How do we raise the profile of AKI?
- Without biomarkers, what is our message?

So from our perspective, how can we change behaviour amongst our colleagues in our hospitals? How do we raise the profile of AKI? Without biomarkers, which we heard about on Sunday, what is our message?
AKI......without biomarkers (for now)

- Prevention
  - Identification of risk factors in all patients
  - Non-elective admissions should always be classed as high-risk for AKI

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>Cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age &gt;65</td>
<td>Atherosclerotic PVD</td>
</tr>
<tr>
<td>Hypovolaemia / hypotension</td>
<td>Liver disease</td>
</tr>
<tr>
<td>Sepsis</td>
<td>Diabetes mellitus</td>
</tr>
<tr>
<td>CKD (baseline eGFR&lt;60)</td>
<td>Nephrotic medications</td>
</tr>
<tr>
<td>Cardiac failure</td>
<td></td>
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</tbody>
</table>

Well, in terms of prevention, it’s what we’ve heard about already. Thinking about risk factors in all patients. When I talk to medical students I say "these are the risk factors for AKI but really there are only three that you can do anything about. If you’re going to do anything, in everybody who comes into hospital as an emergency, think about those three factors and put them right as much as you can".

Then once you’ve done that, keep a close eye on those who are at high risk in terms of managing their fluid assessment and bloods.
Summary

- AKI is common and usually managed by non-nephrologists
- AKI is associated with CKD development / progression
- Early recognition of AKI may prevent future CKD

E-alerts for AKI
- Generate early prompts to clinical staff of new cases of AKI
- Prompt links to early intervention strategies
- Allow analysis of patterns of incidence
- Produce enormous datasets for future study

So in summary, AKI is common and usually managed by non-nephrologists and it's associated with CKD development and progression. Early recognition of AKI may prevent future CKD. The system of e-alerts that have been introduced across hospitals in the UK and elsewhere do generate early prompts to clinical staff of new cases of AKI, so that interventions can be taken early to try and prevent AKI becoming any more severe. They can prompt links to early intervention strategies and allow analysis of patterns of incidence across specialties and produce enormous datasets for future study.

slide 65

Summary

- AKI is common and usually managed by non-nephrologists
- AKI is associated with CKD development / progression
- Early recognition of AKI may prevent future CKD

However:

E-alerts for AKI
- Are not good enough on their own
- Education and training of medical staff essential (starting at undergraduate level)
- Training and support of ward nursing staff needed
- Clear documentation / care plans, etc.
- 'BUY-IN' from the whole hospital is needed

But they're not good enough on their own. We need to complement the alerts with education and training of medical staff, particularly from undergraduate level onwards. Support and training of nursing staff and ward support staff, so that everybody understands how important this is across the entire organisation. This is supported by documentation and care plans etc. but you need the buy in from the whole hospital in an effort to reduce the incidence of CKD in the future.

slide 66
AKI detection as an opportunity to prevent CKD

Acknowledgements

Allie Wilson: Senior Project Support Officer
Melanie Sully: Senior AKI Outreach Nurse Specialist
Stephanie Reid: AKI Outreach Nurse Specialist
Carrie Hewitt: AKI Outreach Nurse Specialist
Adrian Cudmore: Laboratory Manager, Clinical Chemistry

My clinical colleagues at Exeter Kidney Unit

I’d like to acknowledge the rest of our team and my colleagues in Exeter.

Thank you
Chairman: Thank you very much and congratulations for the establishment of this programme which looks great. Any questions from the audience? May I ask you, according to another report, a recent one in NDT it seemed that in the UK but I guess everywhere, even very serious cases of AKI are only followed by a nephrologist let's say 20-25%. That doesn't mean that the others are not doing a good job. But I just want to know if you come to think of the follow-up of these patients for development of CKD, would your alert system attract more serious follow-up by the nephrologist when they’re involved directly from the beginning in the management of these patients? I think it’s certainly something that we need to focus in on. The alerts are there to allow us to pick up cases early on. Most of the cases that end up under the care of the nephrologist will end up with nephrologists but you’re quite right in that there are a number of patients who develop AKI and then recover fully that perhaps aren’t followed up. What we need to be doing is think well, in a more logical way, who of those are at the highest risk for development of CKD in the future in terms of those risk factors that we’ve listed and you listed early on. Keep those under review in more detail. But what interventions can we do? It may just be case of bringing them back to the clinic and watching them.

Prof. Mulgrew: Ok thank you.

Chairman: Two more very, very short questions.

Question: Hello, this is Stefan Becker from Germany. I just have a question, how does it work practically? You have 10 consultations a day I’ve realised. Does the nephrologist call the responsible doctor? Could you just comment briefly on how it’s done practically?

Prof. Mulgrew: So, it differs from hospital to hospital across the UK. In our centre, this is entirely reported back to the end user. Actually, the workload of our nephrology team hasn’t increased significantly with this at all. It’s alerting all the non-nephrology specialty staff that there is something going on and we can then support them and direct them where to go. One thing I didn’t want to do when I introduced the Outreach team was have a kind of hit squad coming in, doing everything for the junior medical staff and then walking away again and then the junior medical staff actually not learning from the experience and saying “well, I don’t really think about that because someone is going to sort it out for me”. So our strategy has been to support the medical teams outside of the renal unit so that they’re in a position to understand what’s happened and try and prevent it from happening again but the alerts go directly back to the pathology screen.

Chairman: Ok thank you. Next, last question please.

Question: I’m interested in the follow-up of people who’ve recovered kidney function to normal and yet we’ve been told they should be followed by a nephrologist. Other than measuring serum creatinine, what does the nephrologist do as values of their care?

Prof. Mulgrew: Well, that’s exactly the point that we don’t know at the moment. At the moment, as I said, following serum creatinine is about as much as we do. It’s more to keep us feeling comfortable I think a lot of the time.

Chairman: Ok, thank you very, very much.