London Acute Kidney Injury Network

London AKI Network Strategy Document

Joining the Network

Membership is entirely voluntary. NHS hospital Trusts have been invited to join the network via an approach to their medical directors from their London AKI Network regional leads.

On a practical level membership will mean you can access the following:

1. An annually updated guideline with an integrated patient pathway for AKI that is fully endorsed by your regional renal unit.
2. An annually updated education resource for your medical staff, consistent with guidelines.
3. Collaboratively designed audits on NCEPOD and other guideline compliance, with access to London-wide data to assess how your organisation is performing.
4. A 'regional governance' structure, to address sector-wide issues such as the safe and timely patient transfers from your organisation to the regional renal unit.
5. Full participation. You will help determine initiatives and developments, including collaborative redesign of regional AKI pathways.

We have collated materials for trust AKI leads in the toolkit (www.londonaki.net/clinical) to enable rapid implementation of our initiatives in your organisation.

If you would like more information, or wish to join the network, please email us: info@londonaki.net. Alternatively contact your London AKI Network regional lead.

Sponsored by NHS Kidney Care

This information is also available on our website at: www.londonaki.net
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Acute Kidney Injury

Kidney function

Kidney function is critical to health and survival.

The kidneys excrete waste products and chemicals (including drugs), regulate body fluid, maintain acid-base balance and control blood electrolyte levels. They achieve this by closely regulating the volume and composition of urine. In addition the kidneys have several endocrine functions - they activate vitamin D (needed for calcium balance), facilitate red cell formation (through the secretion of erythropoietin) and regulate blood pressure (through the production of renin).

To function the kidneys need adequate renal blood flow and oxygenation. The parenchyma or 'substance' of the kidneys must be healthy, rather than damaged or inflamed by disease processes. Finally, the kidneys must be able to drain urine freely through a functioning urinary tract.

What is acute kidney injury?

Acute kidney injury (AKI) is a sudden loss of kidney function.

AKI may be mild, moderate or severe, depending on how much kidney function has been lost. It is diagnosed by the recognition of a rise in serum creatinine levels, ascertained through blood testing. Normally creatinine is produced by muscle and excreted by the kidneys. Acute rises in creatinine levels demonstrate a rapid loss of kidney function, or AKI. AKI may also be diagnosed when there has been a critical fall in urine volumes (known as oliguria).

Recently consensus has been reached on an AKI definiton and grading of severity. AKI has been staged (1-3) according to the magnitude of creatinine rise or severity of oliguria. More information regarding AKI recognition and severity staging is available here: www.londonaki.net/clinical.

AKI happens as a complication of severe infection (sepsis), poor blood flow to the kidneys (seen in dehydration, haemorrhage, cardiac or liver failure), toxicity (from nephrotoxic drugs and radiological contrast), obstruction of the urinary tract (as in malignancy or bladder disease) and due to specific kidney diseases such as nephritis. More information regarding causes of AKI (STOP AKI) can be found here www.londonaki.net/clinical/downloads/stopaki.pdf.

AKI may be community or hospital acquired. The relative proportion of these will vary between hospitals. Hospitals who admit a large number of emergency admissions will have larger rates of AKI on presentation, whereas sites of elective high risk surgery will have more 'hospital acquired' AKI.

Why is acute kidney injury important?

- AKI is a common illness. Several studies have shown that AKI affects around 20% of hospitalised patients, while severe AKI has been shown to occur in 1%.

- AKI is a serious illness. The development of AKI is strongly associated with poor outcomes and prolonged hospital stay. Patients with moderate to severe AKI may develop life threatening fluid overload (causing pulmonary oedema and respiratory failure) and/or metabolic abnormalities (such as hyperkalaemia). Severe AKI has been shown to be one of the strongest predictors of inpatient mortality, the mortality risk it confers exceeding that of acute heart attack. Evidence suggests that the mortality risk associated with AKI begins with mild AKI, with a broadly linear relationship between AKI severity and mortality risk.

- AKI incidence may be rising.

- AKI is often preventable, reversible or badly treated. In 2009 NCEPOD (the National Enquiry into Patient Outcomes and Death) reported on AKI management in UK hospitals and published their findings in 'Adding Insult To Injury'. Deficiencies in care were identified in 50% of cases including failures in AKI prevention, recognition, therapy and timely access to specialist services. 30% of cases were thought to be preventable had adequate measures been in place.

- AKI care is costly. Expenditure due to coding of AKI following an acute admission will shortly exceed that of acute myocardial infarction (heart attack). The Health Service Journal recently reported on AKI as follows. *'Data published by the Department of Health this month shows the NHS spent 1.64bn on treating renal problems in 2009-2010 - a 23% increase on the following year. It was the largest year on year increase of all the major disease categories and now accounts for £11m annual spending by each primary care trust. A major cause was the rapid growth in acute kidney injury. Activity figures seen by HSJ show the number of hospital admissions for AKI grew by 11.5% in 2009-2010, and the number of bed days used by them grew by 10.1%.'* More recently Marion Kerr, a Department of Health Economist, was commissioned by NHS Kidney Care to provide an analysis of the financial cost of AKI. Costs attributable to this condition were estimated to be between £434M and £620M per annum. This is 26-38% of total kidney care expenditure. This condition was estimated to cost more than expenditure on lung and skin cancer combined. The NCEPOD 2009 report on AKI 'Adding Insult To Injury' found that 30% of cases of AKI were preventable. Assuming (as per NCEPOD) 30% of AKI is preventable, successful preventive measures would save the NHS £130M TO £186M per annum.

What are the healthcare needs of AKI patients?

- Patients need to be risk assessed for the possible development of AKI. If there is an increased AKI risk preventive measures should be administered and the patients monitored such that AKI may be detected early.

- When AKI develops AKI appropriate *generic care* must be administered (e.g. fluid therapy).

- A diagnosis should be reached through clinical assessment and investigation and *specific therapy,* aimed at treating an underlying cause (e.g. obstruction or nephritis), should be instituted rapidly. Specialist input from nephrology, critical care, urology or diagnostic services may be required and if so should be accessed in a timely way. This may require inter-hospital transfer.

- If generic care and specific therapy does not reverse AKI, supportive care with renal replacement therapy (dialysis) will be required in a kidney or critical care unit.

- Patients suffering from AKI require holistic, multidisciplinary care, with appropriate support and rehabilitation during recovery.

- Many AKI survivors will have lasting kidney damage and require long-term follow up. A minority have severe irreversible kidney failure necessitating ongoing dialysis or transplantation.

- In some patients AKI may be an end of life event and such patients require appropriative palliative care.

The London Acute Kidney Injury Network

Overview

The London Acute Kidney Injury Network (London AKI Network) is a collaboration of healthcare professionals and organisations involved in acute kidney care throughout London and its referring regions. The network has been sponsored by NHS Kidney Care and is supported by all seven London kidney units, the London Speciality Commissioning Group (SCG), the Department of Health National Acute Kidney Injury Delivery Group and the Medical Directors of our member organisations.

Our aim is equitable, high-quality AKI prevention and care in the capital and beyond. We hope to achieve this through the collaborative delivery of AKI care pathways supported by guidelines, standards, education, clinical audit, innovation and research. We believe by working together we will have the resources, manpower, expertise and critical mass to make rapid and lasting improvements to AKI care in London.

Membership of London AKI Network is voluntary. We have a governance structure that is transparent, representative and accountable. We decide policy through consultation and consensus. We are not wedded to top-down solutions and will support clinicians as they lead on the wider application of local innovation and best practice across the network.

AKI represents a major healthcare challenge. It is a common and serious condition. Care may be complex, logistically difficult and resource intensive. We believe AKI warrants a serious, strategic response similar to that afforded to other acute medical conditions such as stroke, myocardial infarction and trauma.

What is wrong with aki care?

NCEPOD 'Adding Insult to Injury' and local audits have identified several problems that require strategic and collaborative solutions.

1. There are deficiencies in basic AKI management in general ward and acute areas. This is, in part, reflective of generalised failures in management of the acute illness (identified in NCEPOD *'An Acute Problem'*). There are, however, failings in the treatment of isolated acute kidney disease in otherwise stable patients (with, for example, urinary tract obstruction or acute glomerulonephritis). Problems have been identified across the care pathway including aspects of prevention, recognition, diagnostics, therapy, timely referral to specialists and aftercare.

2. Nephrology services have become centralised, while AKI remains widely spread. Nephrology outreach services have often not been configured around delivering specialist advice to acute areas but around, for example, outreach chronic kidney disease programmes. Accessing nephrology advice can be difficult, and there is some evidence of variation in the expectations made of non-specialist teams.

3. The optimal care pathway has not been previously defined or harmonised across sectors. As the pathway involves interaction between tertiary nephrology services, critical care units and local hospital wards within a sector, such pathways must be agreed regionally and there has previously been no mechanism to address this.

website: www.londonaki.net
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4. There is evidence of inequity. The availability of acute dialysis, diagnostic imaging, nephrology advice or interventional radiology (for relief of urinary tract obstruction) varies greatly across sites.

5. Emergency transfer from ward areas to the renal unit for diagnostics and treatment may be delayed. This may prevent timely therapy for more mild AKI that requires disease-specific therapy.

6. While the majority of patients with AKI may be managed in general wards, the minority of patients with severe AKI should be able to access high dependency or kidney unit care rapidly. Such facilities provide 24/7 multidisciplinary specialist care. The mortality risk for severe AKI (AKI 3) exceeds that for acute myocardial infarction (which is normally managed in coronary care units). Given this mortality risk, kidney unit or general high-dependency care would seem warranted for many of these patients.

7. Step-down and transfer of AKI patients from ITU to kidney units for ongoing dialysis is often delayed, resulting in inappropriate use of critical care beds for single-organ support. The critical care environment, with many patients sedated and ventilated, will not be appropriate for many ambulant, rehabilitating patients having isolated kidney support. In addition critical care beds are costly, there are inevitable capacity issues, and these beds may be needed for other patients.

8. There has been no clear or standardised audit strategy for AKI and how a sector performs collaboratively in AKI care, indeed standards to audit against have been lacking.

9. Though national guidelines on AKI (e.g. Renal Association, National Imaging Board) are now available, these have often not been effectively operationalised within NHS Trusts.

10. There appears to be an educational deficit as regards this condition that affects all disciplines at all levels.

11. NCEPOD 'Adding Insult to Injury', has increased awareness and led to a response in many hospitals. We have some evidence, however, of uncoordinated initiatives at both sector and hospital level. Not only may this be counterproductive, but leads to an unnecessary duplication of effort. It is essential that guideline implementation, education, audit and changes in practice are 'joined-up' and mutually supportive. It is also desirable that learning, best-practice and expertise are shared where possible.

12. We lack data on the epidemiology of this condition in London, the resources available, the resources required for more effective care and how these resources should be shared.

What is a clinical network?

Clinical networks have been defined as follows.

'A clinical network is a linked group of health professionals and organisations from primary, secondary and tertiary care, working in a coordinated way that is not constrained by existing organisational or professional boundaries to ensure equitable provision of high quality, clinically effective care.' (1)

'...a means of mobilising resources and coordinating those resources...to implement one or more care pathways designed to meet the needs of a given population...and as a point of accountability for the performance of those resources' (2)

In summary, clinical networks provide a way to get people and organisations working together to deliver better care for patients.

References

1. Baker CD, Lorimer AR. Cardiology: the development of a managed clinical network. *BMJ* 2000;321:1152-3

2. Cropper S, Hopper A, Spencer SA. Managed clinical networks. *Arch Dis Child* 2002;87:1-4

Why an acute kidney injury network for London?

Networks have been successfully used to plan and implement care in other acute conditions such as stroke, trauma and acute coronary syndrome. The *North Central London Acute Kidney Injury Network* was successfully launched in late 2009 and this approach has been adopted in several other regions.

We believe the Network model is particularly appropriate to AKI care in London for the following reasons.

- The AKI care pathway traverses organisations, hospital sites and specialities. As such coordinated, 'joined-up' management requires collaborative working between primary, secondary and tertiary healthcare providers (e.g. local hospitals referring to their regional kidney unit). This is particularly the case in London, where the healthcare system is complex.
- The network will provide a representative, transparent and accountable structure for the delivery of improvements in AKI care in the capital.
- Harmonising the AKI pathway (around evidence and National guidelines) will embed best practice and lead to sustained learning.
- There is evidence of inequity in AKI care in London. Networks, by harmonising pathways and standards, have successfully improved equity in the care of other conditions.
- It will ensure that local innovation can be given a broader platform for adoption.
- The network will facilitate sharing of expertise, manpower and other resources.
- Strategic planning of AKI resources (such as access to acute dialysis) may be performed on a larger scale. The network may facilitate sharing of capacity and will be able to more effectively lobby for increased resources as appropriate.
- Pooling of audit and epidemiological data will greatly increase its power.
- Collaborative research, in partnership with London's clinical research networks, universities and academic health science centres, will be greatly enhanced by the size and diversity of the collaboration.

Organisation and Governance

London AKI Network is a clinical network with voluntary membership. We operate with the support of the Medical Directors of organisations that have decided to join the network. We are supported by the London Specialist Commissioning Group for Renal Services (SCG), NHS Kidney Care (who have also sponsored us) and the Department of Health National AKI Delivery Group.

London AKI Network operates at 3 levels. There is the *London AKI Network Trust Lead* who takes responsibility for AKI initiatives within an organisation. Secondly, there is the *London AKI Network Regional Network,* with its regional leads and Committee Members. They address AKI care at a sector or regional level. Finally the *London AKI Network Board* oversees pan-London strategy and collaboration between the Regional Networks. A similar network structure has been used effectively in other conditions such as stroke.

The Network

The network extends across Greater London and parts of the home counties. It serves a population of in excess of 12 million.

All healthcare organisations that refer to London renal units have been invited to join.

London AKI Network has five *Regional Networks*. Leadership at regional level is generally provided by representatives of the local renal units, who are *London AKI Network regional leads*. They are generally involved in all aspects of the AKI pathway, provide outreach services and AKI advice to local hospitals and take ward and critical care AKI transfers from referring hospitals. They have an overview of AKI care in a region and have a critical role in ensuring AKI pathways run smoothly. Where renal units share a Regional Network they have appointed joint regional leads.

Regional network Local Renal units

- South West London AKI Network: South West Thames Renal and Transplantation Unit (Epsom and St Hellier) and St George's Hospital Renal Unit.
- South East London AKI Network: Guys and St Thomas' Renal Unit and King's Renal Unit.
- North West London AKI Network: Imperial Renal and Transplant Unit.
- North East London AKI Network: Bart's and the London Renal Unit.
- North Central London AKI Network: UCL Centre for Nephrology Royal Free.

London AKI Network Trust Lead

This is the point of contact for AKI initiatives (audit, guidelines, educational, implementation) within an organisation. We have found it important to have a single designated individual who, though they may delegate, has responsibility for the the following.

- Attendance at Regional AKI network committee.
- Point-of-contact within a trust for matters AKI related (including governance).
- Liaise with London AKI Network regional lead to discuss specific concerns regarding tertiary support or transfer.
- Feedback to regional committee on AKI issues (e.g. transfer delays to kidney unit, pathway problems, access to radiology).
- Liaison with the postgraduate department regarding uptake of network induction and education materials.
- Oversight of network audits.
- Provide ownership, within an organisation, of the network guidelines and, if optioned by their organisation, ensure they are compliant with local guideline committee regulations and are available in hospital guidelines.

The AKI toolkit is available from: www.londonaki.net. This is a resource to help London AKI Network Trust Leads rapidly implement our initiatives within an organisation.

London AKI Network Regional Network Committees and Leads

The *London AKI Network Regional Committees* will support the *London AKI Network Trust Leads.* They will oversee AKI care on a regional level. They will aim to implement agreed pan-London and local initiatives. They will respond collaboratively to problems in AKI care identified by committee members or through audit. Finally, they will work with Local Education Providers and local medical schools to ensure AKI education is in place at undergraduate and postgraduate level.

Representation will vary and will be decided on a regional level. In general it will include doctor representatives from acute medicine and critical care in each member hospital (one of whom will be the *London AKI Network Trust Lead*), a nurse representative from each member hospital, a pharmacist, a clinical biochemist and a patient member. The committee will be led by the *London AKI Network regional lead(s)*.

London AKI Network Board

The board provides overall strategy and will oversee the implementation and development of the network. The board has multi-disciplinary and multi-speciality representation. It will facilitate pan-London collaboration on agreed projects, resources and events. The board will pool audit data, map resources, compare regional performance and make the case for increased resources as appropriate. Harmonisation (where possible) and equitable access to care are key aims and the board will have a key role in this. Finally, the board will ensure Londoners are represented in national discussions on AKI care.

Objectives and Implementation

Overall objective

To deliver equitable, high quality acute kidney injury prevention and care to patients in London and referring regions.

Specific objectives

1. To reduce the incidence of acute kidney injury in London.
2. To improve acute kidney injury outcomes in London.
3. To improve holistic and supportive care for AKI patients and their families.
4. To reduce the healthcare costs associated with this condition through more effective care and efficient use of available resources.
5. To support innovation and research that will benefit AKI patients.

Process objectives and implementation

1. A harmonised AKI pathway and guideline, based on national guidelines and available evidence, delivering equitable AKI care according to (where possible) defined clinical standards.

- A phase 1 pathway and guideline, launched on March 8th 2012 following consultation with Network membership at that point.
- The pathway and guidelines are a synthesis of existing national guidelines (UK Renal Association, Intensive Care Society, National Imaging Board, NCEPOD). They are designed to make such national guidelines accessible and facilitate their practical implementation at a local level across a sector. Please note that a written guideline on the interaction between critical care, nephrology and general ward areas (covered in the guideline) is an NCEPOD requirement and this necessitates, in London, regional collaboration.
- The purpose of guidelines is to describe appropriate care based on evidence or consensus, to reduce inappropriate variation in practice, to provide a rational basis for referral, to provide a focus for education, to promote efficient use of resources and to act as a focus for quality control and audit. The usual caveats regarding clinical guidelines apply; that is they are there to guide, rather than dictate, clinical decisions and do not replace the proper assessment of individual cases.
- Available clinical standards (e.g. Diagnostic ultrasound in <24 hours for non-recovering AKI) are embedded in the guideline.
- We will take feedback from network members until March 8th 2013. We will then perform a complete update of the guideline, amending according to this feedback (where possible) and will perform a reconciliation with NICE Acute Kidney Injury (released 2013). Again trusts can adopt the guideline at this point if they wish. Thereafter we will update according to member feedback and new evidence on an annual basis.
- The guidelines are housed in the 'Clinical' section of the website and may be downloaded as the PDF AKI Manual. Core guidelines are also available in the 'London AKI' mobile iphone/ipod application.
- We recommend trusts link to the URL of the website from their local guideline databases. Adoption by local guideline committees, and reformatting if necessary, can be undertaken by the London AKI Network hospital lead.
- London AKI Network provides a suite of educational materials housed within its website and a 'toolkit' to help hospital AKI leads implement the pathway. London AKI Network will ensure these materials are up to date and concordant with the guideline on an annual basis.
- London AKI Network will ensure that London AKI Network sponsored AKI audits are complementary to the guidelines and that data and learning on implementation issues is shared. Network hospital leads and sector committees will address implementation issues and feed back to the board as necessary.
- 'Core' guidelines have been developed initially according to clinical priority, emphasising areas that require network collaboration. Other more specific guidelines will be developed according to emerging evidence or clinical need.

2. Service redesign in AKI care

In some instances it may require a redesign of existing services to deliver the pathway. London AKI Network will make the case for this through consultation with local clinicians, clinical directors, MDs and commissioners.

3. Collaborative AKI audit

- We have partnered initially with the London Specialist Commissioning Group (SCG) Audit and Information Unit (AAIU) on a core AKI audit for hospitals. This audit has a larger footprint including London, SE Coast and East of England. We have collaborated to ensure this audit and the London AKI Network initiative are complimentary and to avoid duplication of effort. The AAIU audit is supported by dedicated AAIU staff and online software. Requests to complete this go to Trust CEOs and Medical Directors. We are working with the National AKI Delivery group (Department of Health) who are keen to develop this into a national AKI dataset.

- We are planning several other audits, including kidney unit transfer (timing and safety), AKI requiring dialysis in kidney units and critical care bed use for single organ kidney support. We will develop other audits through specific forums involving relevant professionals.

- We will not only audit process objectives, but hard AKI outcomes such as mortality, lengths of stay and need for long term renal replacement therapy (RRT) and share this data, driving equity.

- For key parts of the AKI pathway (such as transfer times to kidney unit) we will audit data prospectively in real time, resulting in immediate feedback.

- We will respond to audit data with pathway redesign, guidelines or education as appropriate and, where necessary, seek to address deficiencies in local resources that have been found to impact on care.

- Further information on these audits, other active projects and results are available from: www.londonaki.net/audit. In addition we will seek to share audit data by presenting at London AKI Network, national and international meetings and events and, where possible, through publication in peer-reviewed journals. London AKI Network audits will also be presented to the Pan Thames Renal Audit Group (PTRAG).

4. Improved AKI education

- The London AKI Network 'AKI Academy' is a range of educational resources which can be accessed from: www.londonaki.net/academy. These include online video learning, downloadable powerpoint presentations, self-assessment modules and AKI coursebook. This is designed to support a number of teaching styles and contexts. This resource will grow in time, incorporating sub-speciality areas and will be aimed at all healthcare professionals. Hospitals and AKI leads can access these resources for teaching and induction as they see fit, or may wish to develop their own materials (and in turn share these through the network).

- In addition we will be arranging not for profit AKI Academy events and courses for specific groups of healthcare professionals.

- The regional AKI committees will work with London's medical schools and nursing colleges to ensure undergraduate AKI education is in place. The AKI Academy will house material aimed at undergraduates.

- We will work to ensure national initiatives in AKI education (e.g. national competency frameworks) are implemented within London.

5. Innovation and research

- London AKI Network will initiate and support innovation in AKI care.

- We will support network members as they lead on projects they have developed, supporting wider implementation in London.

- Some initiatives will be implemented on a pan-network scale, however in most cases innovations will be piloted at ward, hospital or sector level prior to wider adoption. We will also seek to implement successful initiatives originating outside of London. An early focus will be the use of AKI electronic alerting, which has been piloted in some centres within London and also at several sites nationally. The network model will facilitate sector-wide, 'joined-up' solutions and more rapid implementation of these and other developments.

- We will use the network as a platform for collaborative, multicentre research translational and clinical AKI research. We will work with London's three academic health science centres in this regard, seeking support from funding bodies, including London's NIHR Clinical Research Networks.

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