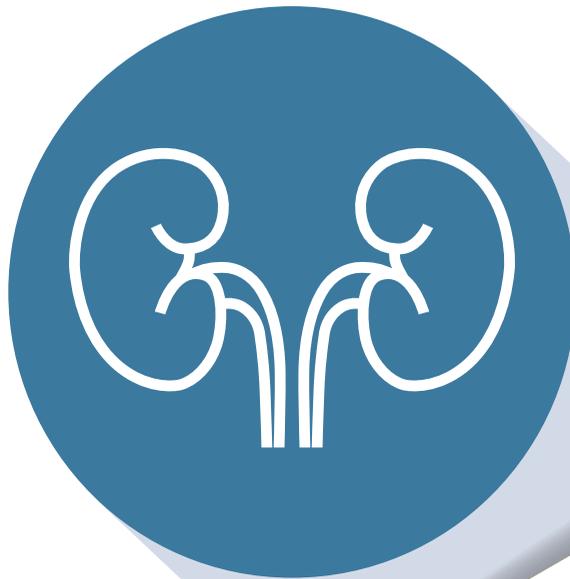




Optimum
Workforce Leadership

Assessing Acute Kidney Injury in care homes



supported by



**Nottinghamshire
County Council**



Health Education England

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What is Acute Kidney Injury?

Acute kidney injury is a sudden and recent reduction in a person's kidney function. It is often referred to as AKI.

Acute kidney injury is identified by blood tests when a raised level of creatinine shows the stage of AKI.

Acute kidney injury can be caused by a number of things such as:

- Stress on the kidneys due to illness or infection.
- Severe dehydration.
- Side effects of some drugs when you are unwell.

AKI is common, serious and harmful; however, you can take steps to prevent it by understanding what it is and what you can do to reduce the risk.

Some residents are at more risk of getting AKI. Your residents with Diabetes/Heart failure etc are at high risk. Work with the nurse in charge or care home owner to compile a list of which residents are at risk.

It is important that these residents drink plenty to stay well hydrated. Keep an eye on urine output and colour and know when to report changes to the nurse in charge or care home owner.

Wherever you work and whatever your role in health and/or care you should be aware of AKI and understand the role of the kidneys. This will enable you to understand how to reduce the risk of AKI for residents in your home.

Health and care professionals need to be well informed and proactive, to understand who is at risk, take an active lead in prevention, learn how to recognise AKI and help the person to recover.

Staff working in care and nursing homes can play a vital role in the early detection, treatment and management of people who may have had an episode of AKI or may be at risk of AKI.

- Define Acute Kidney Injury (AKI).
- Discuss the possible causes of AKI.



The kidneys and what they do?

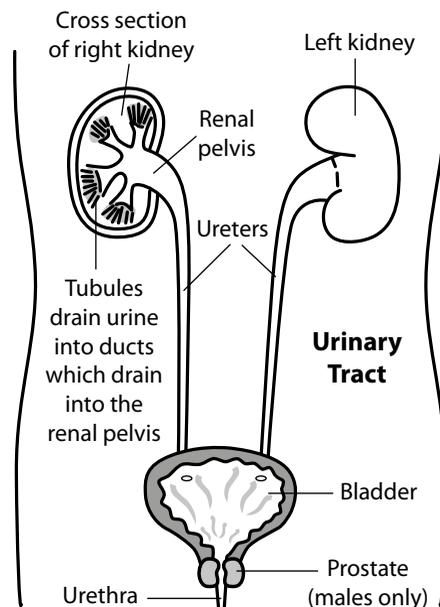
The two kidneys lie to the sides of the upper part of the tummy (abdomen), behind the intestines, and either side of the spine. Each kidney is about the size of a large orange but bean-shaped.

A large artery - the renal artery - takes blood to each kidney. The artery divides into many tiny blood vessels (capillaries) throughout the kidney. In the outer part of the kidneys tiny blood vessels cluster together to form structures called glomeruli.

Each glomerulus is like a filter. The structure of the glomerulus allows waste products and some water and salt to pass from the blood into a tiny channel called a tubule. The liquid that remains at the end of each tubule is called urine. The urine then passes down a tube called a ureter which goes from each kidney to the bladder. Urine is stored in the bladder until it is passed out when we go to the toilet.

The main functions of the kidneys are to:

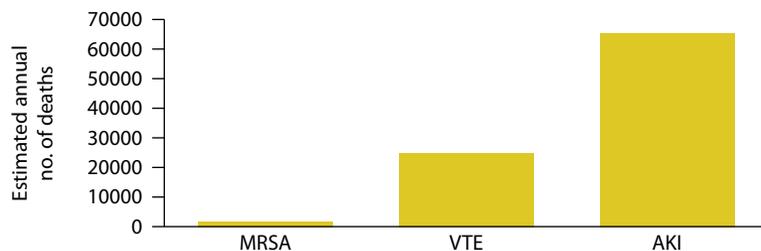
- Filter out waste products from the bloodstream, to be passed out in the urine.
- Help control blood pressure - partly by the amount of water passed out of the body as urine and partly by making hormones which are involved in blood pressure control.
- Make a hormone called erythropoietin, which stimulates the bone marrow to make red blood cells. This is needed to prevent anaemia.
- Control the amount of fluid in the body.
- Help keep various salts and chemicals in the blood at the right level.



Facts

- In the UK up to 100,000 deaths each year in hospital are associated with AKI. Up to 30% could be prevented with the right care and treatment. (NHS England)
- One in five people admitted to hospital in the UK each year as an emergency has AKI.
- National reports identify four out of 10 patients care for AKI is inadequate due to delayed recognition and management. Early interventions improve outcomes.
- Community acquired AKI accounts for 61% of cases as oppose to 39% hospital acquired cases.
- AKI can lead to CKD.
- The kidneys use 25% of blood from every heartbeat.
- 65% of AKI starts in the community.

40000 excess deaths per year Kerr et al (2014)



People most at risk:

- Heart failure
- Diabetes
- Chronic Kidney Disease
- Chronic Liver disease
- Dementia
- Over 75 Acute illness (sickness and diarrhoea)



Causes of AKI

Pre Renal (before the kidneys)

Most common cause of AKI

- Disruption of blood flow to the kidney

For example:

- Low blood pressure
- Heart failure
- Low blood volume
- Sepsis
- Post operative
- Effects of medication

Intrinsic (inside the kidneys)

- Damage to the kidney itself

For example:

- Damage to the tiny filters inside the kidneys (Glomerulonephritis)
- Damage to the kidney cells (Acute Tubular Necrosis)

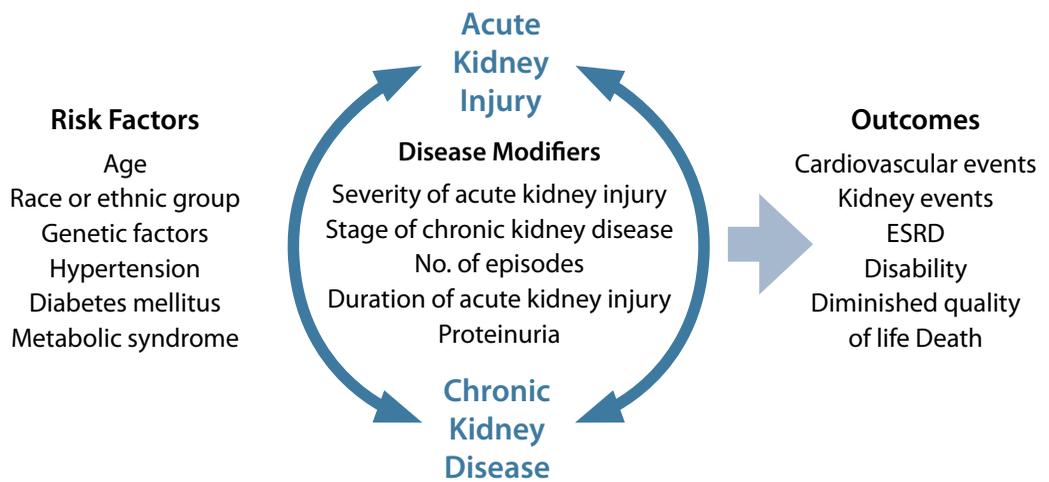
Post Renal (after the kidneys)

- Caused by a blockage in the urinary tract

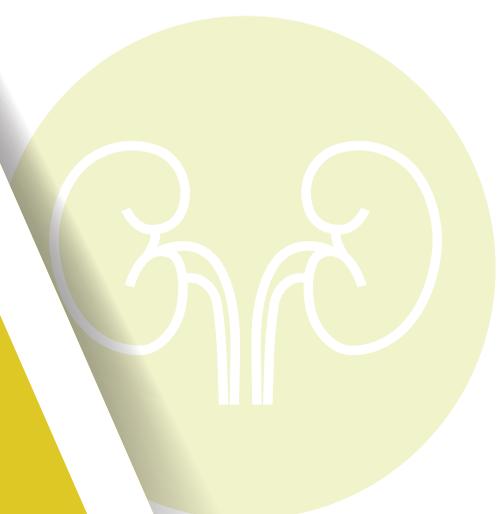
For example:

- Blocked catheter
- Kidney stones (renal calculi)
- Bladder tumour
- Enlarged prostate





Patients with AKI don't die of kidney failure.
 AKI often occurs as part of an acute illness acts as a force multiplier!



What do the kidneys do?

- Remove waste
- Make urine
- Remove excess fluid from the body
- Control the body's chemical balance
- Process medicines
- Help control BP
- Plump fluid or blood around the body
- Help to make red blood cells
- Control the body's temperature
- Help keep bones healthy
- Cleans or filters blood

Signs and symptoms

In the early stages there may be no real symptoms or signs. A blood test is needed to detect it.

However, someone with AKI can deteriorate quickly and suddenly experience any of the following:

- Changes to urine output, particularly a major reduction in the amount of urine passed.
- Changes to urine colour/smell.
- Nausea, vomiting.
- Abdominal pains and feeling generally unwell, similar to a hangover.
- Dehydration or thirst.
- Confusion and drowsiness.

Consider urine dipstick to test for presence of blood.



Preventing AKI

Staff working in care and nursing homes can play a vital role in the early detection, treatment and management of people who may be at risk of AKI.

- Maintain fluid balance.
- Avoid dehydration is the underlying cause of many common conditions including constipation, falls, urinary tract infections, pressure ulcers, malnutrition, incontinence, confusion and pre renal AKI.

The elderly are more prone to dehydration because a person may lose the ability to recognise thirst. Poor mobility and incontinence may mean a person avoids drinking enough. Remember if a person has AKI they may pass less urine than usual, or pass no urine at all.

Some residents may need further support to stay hydrated.

For example:

- Beakers instead of cups.
- Support and encouragement to maintain fluid intake throughout the day.
- It could be as simple as setting drink routines rather than relying on thirst alone.
- Jelly / ice cream can be offered to increase fluid intake if the resident doesn't want to drink.
- Consider how you can encourage drinking at night?
- Remember encourage fluids when giving any type of care.



Signs of Dehydration



- Thirst
- Dark urine
- Sunken eyes
- Irritability
- Confusion
- Cool hands or feet
- Low Blood Pressure
- Raised Heart Rate
- Headaches

The urine colour chart below provides some indication as to whether your resident is drinking enough. Good indicating “hydration” to “severe dehydration”. The tool is an indicator but it is not a diagnostic tool.

| | | |
|---|--|--------------------|
| 1 | | Good |
| 2 | | Good |
| 3 | | Fair |
| 4 | | Dehydrated |
| 5 | | Dehydrated |
| 6 | | Very dehydrated |
| 7 | | Severe dehydration |



Assessing fluid balance in residents

When you start to assess fluid balance you may face some barriers.

Example

The resident goes to the toilet independently and doesn't tell the carer so it isn't recorded on the chart.

Can the resident record their own balance? Explain the importance of recording it and give them a chart to complete.

The relatives give drinks to the resident so it is difficult to record how much fluid is being taken.

Give the relatives a sheet with the amounts on. Get them to document the amounts on fluid balance. This works for some residents too

To help understand the quantities, how much fluid do you think is in these...?

The resident is incontinent of urine, making it difficult to assess how much has been passed.

If weighing the sheet is an impractical proposition, (and most often it is), try estimating.

Is this impossible?

How will you use this information to inform you about urine output when residents are wearing pads?

Have you considered using pads with level indicators?

Q How much urine is there?



Answer: Approximately 50 ml



Think kidneys

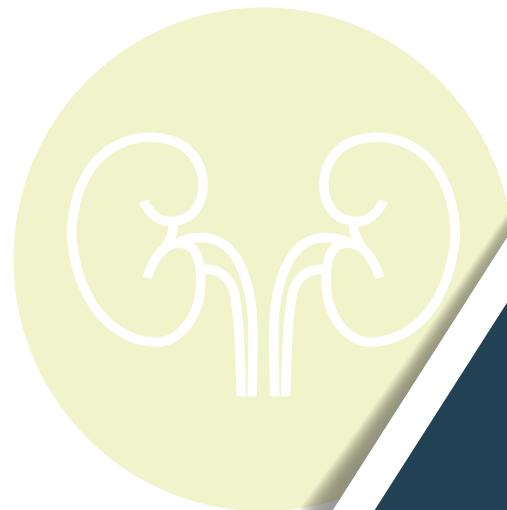
The kidneys don't usually complain

The kidneys can lose up to 90% of their function before you may even begin to notice

The kidneys are clever organs but need a good blood supply to work effectively.

When assessing residents consider:

- Have they passed urine?
- Do they show signs of dehydration?
- Do they have any risk factors for AKI?
- If they are ill with sickness and/or diarrhoea they may need to temporarily suspend some medications.
- Ask the nurse in charge for a visit from the GP.



| Question | Answer |
|--|--------|
| <p>1 Approximately what percentage of people in the community are admitted to hospital with AKI?</p> | |
| <p>2 Name the different functions undertaken by the kidneys.</p> | |
| <p>3 Identify as many symptoms of dehydration as you can.</p> | |
| <p>4 What symptoms displayed by a resident would lead you to consider the possibility of AKI?</p> | |
| <p>5 What type of person is at risk from AKI?</p> | |



| Question | Answer |
|---|--------|
| 6 Can you identify the non-modifiable risk factors associated with AKI? | |
| 7 Identify some of the environmental factors which can attribute to AKI. | |
| 8 What medications can increase the risk of AKI? | |
| 9 Identify as many preventative measures which can help manage the risk of AKI. | |
| 10 What percentage of the blood do the kidneys use from the hearts blood supply each day? | |



Case Study 1

Marjory is an 83 year old resident in your care home. She has been with you for the past three years, since she fell at home and fractured her hip. This led to her feeling anxious at home and worried about falling again. She has also lost confidence in walking and likes to have assistance to walk around the home.

Marjory likes living in the residential home and has made some good friends and enjoys chatting.

She takes ibuprofen for some pain in her hip. She is a Non-Insulin Dependent Diabetic (NIDDM) and has to be careful about eating food containing high sugar levels. She takes Metformin for this. Marjory has some heart failure and takes Furosemide and Ramipril for this.

Think about what you learnt in weeks two and eight to answer the following questions:

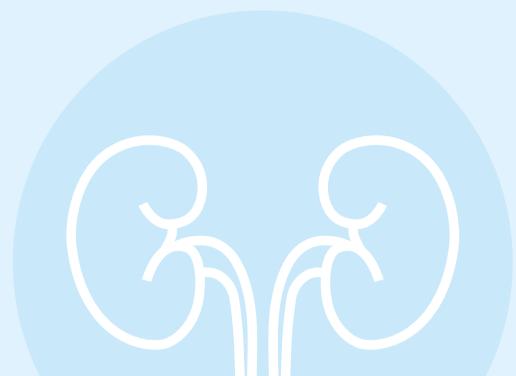
- Is Marjory at risk of AKI?
- How do you know this?
- How can each member of the team help reduce her risk?

It's Friday morning and you go to see Marjory to offer to help her to get up and dressed. She doesn't seem to recognise you, and when you help her out of bed you find she has been incontinent of urine. The urine has a strong odour and is dark in colour.

- What might be wrong with Marjory?
- What steps can you take to help Marjory?

On Monday, Marjory is feeling much better, but she is now anxious about being incontinent again and doesn't want to drink very much of the extra fluids she is being offered.

- What can you do to help?



Case Study 2

Albert is a 70 year old male with a previous myocardial infarction, hypertension, osteoarthritis and chronic kidney disease stage 3.

Albert has been admitted to hospital with AKI associated with D+V due to salmonella and recovers well with intravenous fluids.

Three days later he is discharged with all medications stopped.

Serum creatinine on discharge 165 $\mu\text{mol/L}$ (peak creatinine 280 $\mu\text{mol/L}$; baseline creatinine 118 $\mu\text{mol/L}$).

Alberts BP is now 178/78. Albert is on the following medications:

- Ramipril 5mg od
- Frusemide 40 mg od
- Asprin 75mg od
- Simavastatin 10mg od
- Amlodopine 5 mg od

What approach should be taken in relation to reviewing his medication?

Conclusion

Some residents are at more risk of getting AKI. Your residents with diabetes/heart failure etc are at high risk.

Work with the nurse in charge or care home manager to compile a list of residents who are at risk.

It is important that these residents drink plenty to stay well hydrated. Keep an eye on urine output, colour etc. Know when to report changes and what actions you need to take.



References

Kerr M, Bedford M, Matthews B, O'Donoghue D. The economic impact of acute kidney injury in England. *Nephrol Dial Transplant* (2014) 29: 1362–1368.

National Confidential Enquiry into Patient Outcome and Death (NCEPOD) 2009. *Acute Kidney Injury: Adding Insult to Injury*.

National Institute for Health and Care Excellence (NICE) 2013, Clinical guideline 169, *Acute Kidney Injury*.

Selby NM, Crowley L, Fluck RJ, McIntyre CW, Monaghan J, Lawson N, Kolhe NV. Use of electronic results reporting to diagnose and monitor AKI in hospitalized patients. *Clin J Am Soc nephrol*. 2012 Apr;7(4):533-40. doi: 10.2215/CJN.08970911. Epub 2012 Feb 23

Urine colour chart: <http://jbfitnesssystems.com/eddie-vendetta-part-2/>

Claire Stocks - Sister – Cardiac Arrest Prevention Team Darlington Memorial Hospital



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