Papworth Hospital NHS
NHS Foundation Trust

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Key points of this document

- The purpose of the procedure is to provide direction and guidance in the management of the patient with Acute Kidney Injury (AKI) within Papworth Hospital NHS Foundation Trust.
- This Document sets out the procedure for assessing patients for AKI risk, investigating those patients for AKI and the management of them once diagnosed.
- Chronic Kidney Disease (CKD) can develop into AKI and this document provides guidance on the management of this patient group.

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1.**Introduction**

The purpose of the procedure is to provide direction and guidance in the management of patients within Papworth Hospital NHS Foundation Trust who develop Acute Kidney Injury (AKI).

AKI or Acute kidney injury, previously known as acute renal failure, encompasses a wide spectrum of injury to the kidneys, not just kidney failure. The definition of acute kidney injury has changed in recent years, and detection is now mostly based on monitoring creatinine levels, with or without urine output.

Acute kidney injury is seen in 13–18% of all people admitted to hospital, with older adults being particularly affected. There have been concerns that suboptimal care may contribute to the development of acute kidney injury. In 2009, the National Confidential Enquiry into Patient Outcome and Death (NCEPOD) reported the results of an enquiry into the deaths of a large group of adult patients with acute kidney injury. This described systemic deficiencies in the care of patients who died from acute kidney injury; only 50% of these patients had received 'good' care.

Other deficiencies in the care of patients who died of acute kidney injury included failures in acute kidney injury prevention, recognition, therapy and timely access to specialist services. This report led to the Department of Health's request for NICE to develop its first guideline on acute kidney injury in adults and also, importantly, in children and young people.

This guideline emphasises early intervention and stresses the importance of risk assessment and prevention, early recognition and treatment. It is primarily aimed at the non-specialist clinician, who will care for most patients with acute kidney injury in a variety of settings across the hospital.

Incidence of AKI within Papworth Hospital NHS Foundation Trust is approximately 20 – 30% within the cardiothoracic surgical patient population and approximately 10% within the cardiology patient population. Given the recognised risk factors for AKI (see Appendix 1), and the aetiology of cardiovascular disease it is not surprising to see an increased incidence of AKI within our patient group.

It has been identified that nearly every patient admitted to Papworth Hospital NHS Foundation Trust will have two or three risk factors of developing AKI whilst in hospital and therefore standardised baseline measurements are taken on every patient at admission and subsequently during their inpatient stay to ensure that AKI is quickly and correctly identified, detected and managed according to the AKI Pathway.

Terms used within the guidance

What is AKI?
'rapid reduction in kidney function resulting in a failure to maintain fluid, electolyte and acid-base homoeostasis' [1]

AKI is defined as any of the following:[2]

- Increase in sCr by ≥26.5 µmol/l within 48 hours; or
- Increase in sCr to ≥1.5 times baseline, which is known or presumed to have occurred within the prior 7 days; or
- Urinie volume <0.5ml/kg/hr for 6 hours

Staging of AKI[2]

Stage	Serum creatine	Urine output
1	1.5–1.9 times baseline OR ≥26.5 µmol/l increase	<0.5 ml/kg/h for 6–12 hours
2	2.0–2.9 times baseline	<0.5 ml/kg/h for ≥12 hours
3	3.0 times baseline OR Increase in serum creatinine to ≥350 µmol/l OR Initiation of renal replacement therapy OR In patients <18 years, decrease in eGFR to <35 ml/min per 1.73 m^2	<0.3 ml/kg/h for ≥24 hours OR Anuria for ≥12 hours

Nephrotoxic medications

- NSAIDs
- Angiotensin converting enzyme inhibitors
- Angiotensin receptor blockers
- Amioglycosides
- Diuretics

[1] Renal Association – www.renal .org
[2] Kidney International Supplements (2012) 2, 4; doi:10.1038/kisup.2012.4

2. Duties

2.1 Responsibility of all employees:
NB: All employees refers to all personnel who work within the trust, including non executive directors, bank staff, agency and locum staff, volunteers, trainees, students and contracted staff.

2.1.1 *To adhere to the policy.*

2.1.2 To ensure that they have read and understood sufficient detail of this policy and other documents relevant to their job to enable them to carry out their work.

2.1.3 To seek clarification from their line manager or the senior manager responsible for the initiation and review of this policy if unsure about any part of the policy or relevant document.

2.1.4 To be aware of the current version of this policy and other documents and how to access them.

2.2 Responsibility of managers:

2.2.1 To be responsible for the implementation of, and compliance with this policy and other documents within their area of management. To report any non compliance to senior management via the trusts incident reporting system and ensure action is taken in relation to the non-compliance, ensuring closure of the loop.

2.2.2 To ensure that this policy is accessible to staff members in the form of a paper copy or through the intranet.

2.2.3 To clarify issues for any member of staff who does not understand any part of this policy or assist them in obtaining clarification from the document initiator.
2.2.4 To make staff aware of any changes to, or revision of the procedure.
2.2.5 To take local decisions within the defined parameters of the policy.

3. Assessment of Acute Kidney Injury

3.1 Assessing all patients admitted to hospital for routine, elective or emergency reasons

Ensure patients who are admitted to Papworth Hospital NHS Foundation Trust, either via the pre-admission pathway or by direct admission to hospital have the following recorded; (Please refer to Appendix 1, AKI Risk Factors Identification)
3.1.1 Baseline Creatinine, Urea and Electrolytes
3.1.2 Baseline Weight
3.1.3 Urinalysis
3.1.4 Routine Observations and CTEWS
3.1.5 Routine examination by the medical team to identify any physical abnormalities or concerns prior to their intended procedure / investigation with specific attention to the patient's fluid volume status
3.1.6 Full drug history recorded on drug chart / medical notes

If any abnormalities are detected on admission or via the pre-admission pathway i.e. an elevated serum creatinine, abnormal urea & electrolyte levels, reduced fluid volume status on examination, history suggestive of postural hypotension, syncope, fluid or nutritional depletion please ensure that the patient also has the following as per AKI Risk Factors Identification, (Appendix 1)
3.1.7 eGFR calculated [Appendix 3]
3.1.8 Medication review and adjustment for nephrotoxins and other medications as appropriate
3.1.9 Lying and standing BP
3.1.10 Assessment for requirements of either oral or IV fluid administration prior to procedure / surgery
3.1.11 Discussion with the patients consultant with regards the pre-procedural management
3.1.12 Careful documentation of the above in the medical notes
3.1.13 Subsequent daily monitoring of creatinine, electrolytes and weight

3.2 Assessing risk factors in adults having iodinated contrast agents

3.2.1 Before offering iodinated contrast agents to adults for non-emergency imaging, investigate for chronic kidney disease by measuring eGFR or by checking an eGFR result obtained within the past 3 months. [Refer to Appendix 3 for eGFR staging]

Emergency or non-emergency imaging, assess their risk of acute kidney injury. Be aware that increased risk is associated with:

- Chronic kidney disease (adults with an eGFR less than 40 ml/min/1.73 m^2 are at particular risk) [See Appendix 3]
- Diabetes but only with chronic kidney disease (adults with an eGFR less than 40 ml/min/1.73 m^2 are at particular risk) [See Appendix 3]
- Heart failure
- Renal transplant
- Age 75 years or over
- Hypovolaemia
- Increasing volume of contrast agent
- Intra-arterial administration of contrast agent.
- Ensure that risk assessment does not delay emergency imaging.

3.2.2 Include the risks of developing acute kidney injury in the routine discussion of risks and benefits of the imaging procedure.

3.3 Assessing risk factors in adults having surgery

3.3.1 All patients admitted for either elective or in-house urgent surgery should have baseline creatinine, urea and electrolyte measurements taken and these should be clearly documented within the ICP. In all emergency cases, baseline levels of creatinine, urea and electrolytes should be obtained on admission.

3.3.2 Assess the risk of acute kidney injury in adults before surgery. Be aware that increased risk is associated with:

- Emergency surgery, especially when the patient has sepsis or hypovolaemia
- Intra-peritoneal surgery
- Chronic kidney disease (adults with an eGFR less than 60 ml/min/1.73 m^2 are at particular risk) [See Appendix 3]
- Diabetes
- Heart failure
- Age 65 years or over
- Liver disease
- Use of drugs with nephrotoxic potential in the perioperative period

Use the risk factors identification form to inform the clinical management plan. (See Appendix 1)

3.3.3 Include the risks of developing acute kidney injury in the routine discussion of risks and benefits of surgery with the patient.

4. Identifying Acute Kidney Injury

4.1 Identifying acute kidney injury in patients with acute illness

4.1.1 Investigate for acute kidney injury, by measuring serum creatinine and comparing with baseline, in adults with acute illness if any of the following are

likely or present:

- Chronic kidney disease (adults with an estimated glomerular filtration rate [eGFR] less than 60 ml/min/1.73 m2 are at particular risk) [See Appendix 3]
- Heart failure
- Liver disease
- Diabetes
- History of acute kidney injury
- Oliguria (urine output less than 0.5 ml/kg/hour)
- Neurological or cognitive impairment or disability, which may mean limited access to fluids because of reliance on a carer
- Hypovolaemia
- Use of drugs with nephrotoxic potential (such as non-steroidal anti-inflammatory drugs [NSAIDs], aminoglycosides, angiotensin-converting enzyme [ACE] inhibitors, angiotensin II receptor antagonists [ARBs] and diuretics) within the past week, especially if patient is hypovolemic
- Use of iodinated contrast agents within the past week
- Symptoms or history of urological obstruction, or conditions that may lead to obstruction
- Sepsis
- Deteriorating early warning scores (EWS)
- Age 65 years or over.

Any patient identified as having AKI as an inpatient will follow the AKI Ward Pathway; Appendix 2. Once AKI is detected according to their serum creatinine rise, each patient should be assessed on a daily basis according to the pathway and the multi-disciplinary team should ensure that all crucial components of the AKI Ward Pathway are completed and any reasons for exemption clearly documented in the nursing or medical notes.

4.2 Identifying acute kidney injury in patients with no obvious acute illness

4.2.1 Be aware that in adults and young people with chronic kidney disease and no obvious acute illness, a rise in serum creatinine may indicate acute kidney injury rather than a worsening of their chronic disease.

4.2.2 Ensure that acute kidney injury is considered when an adult or young person presents with an illness with no clear acute component and has any of the following:

- chronic kidney disease, especially stage 3B, 4 or 5, or urological disease
- new onset or significant worsening of urological symptoms
- symptoms suggesting complications of acute kidney injury
- symptoms or signs of a multi-system disease affecting the kidneys and other organ systems (for example, signs or symptoms of acute kidney injury, plus a purpuric rash).

Any patient identified as having AKI as an inpatient will follow the AKI Ward Pathway; Appendix 2. Once AKI is detected according to their serum creatinine rise,

each patient should be assessed on a daily basis according to the pathway and the multi-disciplinary team should ensure that all crucial components of the AKI Ward Pathway are completed and any reasons for exemption clearly documented in the nursing or medical notes.

5. Preventing acute kidney injury

5.1 Ongoing assessment of the condition of patients in hospital

5.1.1 Follow the recommendations in DN538 Management of the Deteriorating Patient to identify adults who are at risk of acute kidney injury because their clinical condition is deteriorating or is at risk of deteriorating. (DoH, 2009; NICE, 2007)
5.1.2 When adults are at risk of acute kidney injury, use VitalPAC to record full parameter observations as directed in DN538 Management of Deteriorating Patient including urine output with a frequency appropriate for the patient's condition.

5.1.3 Monitor Urine Output at least 4hrly if not catheterised and hourly if catheter present – ensuring all outputs clearly documented on fluid balance charts and running totals calculated. Escalate appropriately for every patient if Oliguria detected for more than 2 hours.

5.1.4 Ensure the recommendations within DN559 Fluid Management Procedure are adhered to and the patient's fluid status is optimised in line with the guideline. For cardiothoracic surgical patients follow day 0 and day 1 fluid management flow charts and refer to the Standard IV Fluid Maintenance Protocol.

5.1.4 Increase the frequency of observations if abnormal physiology is detected and inform the ALERT team and medical team where appropriate (MEWS > 4).

5.2 Preventing acute kidney injury in adults having iodinated contrast agents

5.2.1 Offer intravenous volume expansion to adults having iodinated contrast agents if:

- they are at increased risk of contrast-induced acute kidney injury because of risk factors, or they have an acute illness.
- Offer IV fluids in line with clinician preference

5.2.2 Consider temporarily stopping ACE inhibitors and ARBs in adults having iodinated contrast agents if they have chronic kidney disease with an eGFR less than 40 ml/min/1.73 m^2. [See Appendix 3]

5.2.3 Discuss care with a nephrology team before offering iodinated contrast agent to adults with contraindications to intravenous fluids if:

- they are at increased risk of contrast-induced acute kidney injury, or
- they have an acute illness, or
- they are on renal replacement therapy.

5.3 Monitoring and preventing deterioration in patients with or at high risk of acute kidney injury

5.3.1 Seek advice from a pharmacist about optimising medicines and drug dosing in adults and young people with or at risk of acute kidney injury.

5.3.2 Consider temporarily stopping ACE inhibitors and ARBs in adults and young people with diarrhoea, vomiting or sepsis until their clinical condition has improved and stabilised.

6. Detecting acute kidney injury

6.1.1 Detect acute kidney injury by using any of the following criteria:

- a rise in serum creatinine of 26.5 micromol/litre or greater within 48 hours
- a 50% or greater rise in serum creatinine known or presumed to have occurred within the past 7 days
- a fall in urine output to less than 0.5 ml/kg/hour for more than 6 hours in adults and more than 8 hours in children and young people
- a 25% or greater fall in eGFR in young people within the past 7 days.

6.1.2 Monitor serum creatinine regularly in all adults and young people with or at risk of acute kidney injury.

7. Identifying the cause(s) of acute kidney injury

7.1.1 Identify the cause(s) of acute kidney injury and record the details in the patient's notes.

7.1.2 Perform urine dipstick testing for blood, protein, leucocytes, nitrites and glucose in all patients as soon as acute kidney injury is suspected or detected. Document the results and ensure that appropriate action is taken when results are abnormal.

7.1.3 Do not routinely offer ultrasound of the urinary tract when the cause of the acute kidney injury has been identified.

7.1.4 When pyonephrosis (infected and obstructed kidney[s]) is suspected in adults or young people with acute kidney injury, offer immediate ultrasound of the urinary tract (to be performed within 6 hours of assessment).

7.1.5 When adults or young people have no identified cause of their acute kidney injury or are at risk of urinary tract obstruction, offer urgent ultrasound of the urinary tract (to be performed within 24 hours of assessment).

8. Managing acute kidney injury

Any patient identified as having AKI as an inpatient will follow the AKI Ward Pathway; Appendix 2. Once AKI is detected according to their serum creatinine rise, each patient should be assessed on a daily basis according to the pathway and the multi-disciplinary team should ensure that all crucial components of the AKI Ward Pathway are completed and any reasons for exemption clearly documented in the nursing or medical notes.

8.1 Pharmacological management

8.1.1 Do not routinely offer loop diuretics to treat acute kidney injury.

8.1.2 Consider loop diuretics for treating fluid overload or oedema while: an adult or young person is awaiting renal replacement therapy, or renal function is recovering in an adult or young person not receiving renal replacement therapy.

8.1.3 Do not offer low-dose dopamine to treat acute kidney injury.

8.2 Referring for renal replacement therapy

8.2.1 Discuss any potential indications for renal replacement therapy with a Nephrologist and/or critical care specialist immediately to ensure that the therapy is started as soon as needed.

8.2.2 When an adult or young person has significant comorbidities, discuss with them and/or their parent or carer and within the multidisciplinary team whether renal replacement therapy would offer benefit.

8.2.3 Refer adults and young people immediately for renal replacement therapy if any of the following are not responding to medical management:

- Hyperkalaemia
- Metabolic acidosis
- Symptoms or complications of uraemia (for example, pericarditis or encephalopathy)
- Fluid overload
- Pulmonary oedema.

8.2.4 Base the decision to start renal replacement therapy on the condition of the Adult or young person as a whole and not on an isolated urea, creatinine or potassium value.

8.2.5 When there are indications for renal replacement therapy, the nephrologist and/or critical care specialist should discuss the treatment with the patient and/or their parent or carer as soon as possible and before starting treatment.

8.3 Referring to nephrology

8.3.1 Refer adults and young people with acute kidney injury to a nephrologist, paediatric nephrologist or critical care specialist immediately if they meet criteria for renal replacement therapy in recommendation 8.2.3.

8.3.2 Do not refer adults or young people to a nephrologist or paediatric nephrologist when there is a clear cause for acute kidney injury and the condition is responding promptly to medical management, unless they have a renal transplant.

8.3.3 Consider discussing management with a nephrologist or paediatric nephrologist when an adult or young person with severe illness might benefit from treatment, but there is uncertainty as to whether they are nearing the end of their life.

8.3.4 Refer adults or young people in intensive care to a nephrology team when there is uncertainty about the cause of acute kidney injury or when specialist management of kidney injury might be needed.

8.3.5 Discuss the management of acute kidney injury with a nephrologist as soon as possible and within 24 hours of detection when one or more of the following is present:

- A possible diagnosis that may need specialist treatment (for example, vasculitis, glomerulonephritis, tubulointerstitial nephritis or myeloma)
- Acute kidney injury with no clear cause
- Inadequate response to treatment
- Complications associated with acute kidney injury
- Stage 3 acute kidney injury
- a renal transplant
- chronic kidney disease stage 4 or 5.

8.3.6 Monitor serum creatinine after an episode of acute kidney injury. Consider referral to a nephrologist when eGFR is 30 ml/min/1.73 m_2 or less in adults or young people who have recovered from an acute kidney injury.

Appendix 1

Acute Kidney Injury (AKI) Risk Factors Identification

Papworth Hospital NHS
NHS Foundation Trust

Is your patient at risk of Acute Kidney Injury (AKI)?

Are any of the following risks relevant to the patient?

K	Chronic Kidney Disease (CKD)?
I	Iodinated Contrast?
D	Deteriorating Vital Signs i.e. Is your patient septic, hypovolaemic, Is their CTEWS ≥ 4?
N	Nephrotoxic medications? i.e. ACE Inhibitors, NSAIDs, Antiotensin Receptor Blockers, Amioglycosides or Diuretics?
E	Existing medical conditions i.e. Diabetes, Liver Disease, Ischaemic heart disease/heart failure, Hypertension, Peripheral vascular disease, Urological obstruction?
Y	Years of age > 65 Years Old?

On admission please ensure that all the following are obtained;

- Baseline observations and If CTEWS ≥4 inform the ALERT team, Bleep 432
- Check serum creatinine and then following any intervention and / or at least 24hrs later
- Urine dipstick
- Baseline weight

If any of the above risk factors are evident please complete the following;

- eGFR
- Assess fluid volume status of patient including lying and standing BP
- Ensure adequate oral intake or prescribe IV fluids to correct hypovolaemia
- Avoid IV contrast if possible
- Medication review for nephrotoxicity

AKI is defined by any of the following:[1]

- Increase in sCr by ≥26.5µmol/l within 48hrs, or;
- Increase in sCr by ≥1.5 x baseline in 7days
- Urine Volume <0.5mls/kg/hr for 6 hrs

1. Kidney International Supplements (2012) 2,4; doi: 10.1038/kisup2012.4

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Are any of the following risks relevant to the patient?

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N	Nephrotoxic medications? i.e. ACE Inhibitors, NSAIDs, Antiotensin Receptor Blockers, Amioglycosides or Diuretics?
E	Existing medical conditions i.e. Diabetes, Liver Disease, Ischaemic heart disease/heart failure, Hypertension, Peripheral vascular disease, Urological obstruction?
Y	Years of age > 65 Years Old?

On assessment please ensure that all the following are obtained;

- Baseline observations and If CTEWS ≥4 inform the ALERT team, Bleep 432
- Check serum creatinine, Urea and electrolytes
- Urine dipstick
- Baseline weight

If any of the above risk factors are evident please complete the following;

- Check eGFR
- Assess fluid volume status of patient including lying and standing BP
- Ensure adequate oral intake or prescribe IV fluids to correct hypovolaemia
- Avoid IV contrast if possible
- Medication review for nephrotoxicity

AKI is defined by any of the following:[1]

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- Urine Volume <0.5mls/kg/hr for 6 hrs

If AKI diagnosed – start AKI pathway (overleaf)

1. Kidney International Supplements (2012) 2,4; doi: 10.1038/kisup2012

Papworth Hospital NHS
NHS Foundation Trust

Acute Kidney Injury (AKI) Ward Pathway

Papworth Hospital NHS Foundation Trust

This document is a summary of care, it includes the **crucial** components of care, but not all. If tasks are not completed, please record the exemption reason in the medical notes.

Ward _____
Date of Admission ____/____/____
Procedure Date _____/____/____
Admission Creatinine _____

Hospital ID:
Surname:
Forename:
DOB:
NHS No:
(Use Addressograph Label)

Key Stages		Pathway Day 1	Day 2	Day 3	Day 4	Day 5 onwards
Date						
Signature (Medical / Nursing)						
Bleep						
Assessment	Nursing	• Full set of observations • Lying and standing BP • Urine dipstick • Daily weight • Fluid balance chart initiated	• Daily weight • 4hrly Observations • Documented urine output • Fluid balance chart	• Daily weight • 4hrly Observations • Documented urine output • Fluid balance chart	• Daily weight • 4hrly Observations • Documented urine output • Fluid balance chart	• Daily weight • 4hrly Observations • Documented urine output • Fluid balance chart
	Medical	• Blood tests requested/recorded • AKI risk factors reviewed • Volume Status recorded • Medication review for nephrotoxicity • Consultant review within 12hrs	• Re-assess volume status • Measure U&E • Review investigations • Consider USS of renal tract if indicated	• Ensure patient is euvolaemic • Ensure underlying cause for AKI is treated • Investigations reviewed	• Measure U& Es • Ensure patient is euvolaemic • Ensure underlying cause for AKI is treated • Investigations reviewed	• Measure U& Es daily until Creat falling • Ensure patient is euvolaemic • Ensure underlying cause for AKI is treated • Investigations reviewed
Treatment	Medical	• IV fluid to correct hypovolaemia • Consider stopping nephrotoxic medications • Treatment of underlying cause • Consider referral to CCA for Renal replacement if criteria in AKI Guideline Met	• Review need for IV fluids • Review need for IV antibiotics • Consider nephrology advice • Consider referral to CCA for Renal replacement if criteria in AKI Guideline Met	• Stop IV fluids if PO intake adequate • Switch to PO antibiotics if clinical condition allows • Consider nephrology advice if not sought before now and no improvement in U&Es • Consider referral to CCA for Renal replacement if criteria in AKI Guideline Met	• Stop IV fluids if PO intake adequate • Switch to PO antibiotics if clinical condition allows • Consider nephrology advice if not sought before now • Consider referral to CCA for Renal replacement if criteria in AKI Guideline Met	• Stop IV fluids if PO intake adequate • Switch to PO antibiotics if clinical condition allows • Consider nephrology advice if not sought before now • Consider referral to CCA for Renal replacement if criteria in AKI Guideline Met
	Pharmacy	• Medication review for nephrotoxicity • Medication adjusted for AKI	• Medication adjusted for AKI	• Medication adjusted for AKI	• Medication adjusted for AKI	• Medication adjusted for AKI

Stages of chronic kidney disease

Stage	eGFR (ml/min/ 1.73 m^2)	Description	Qualifier
1	≥ 90	Kidney damage, normal or increased GFR	Kidney damage (presence of structural abnormalities and/or persistent haematuria, proteinuria or microalbuminuria) for ≥ 3 months
2	60-89	Kidney damage, mildly reduced GFR	
3A	45-59	Moderately reduced GFR ± other evidence of kidney damage	GFR < 60 ml/min for ≥ 3 months ± kidney damage
3B	30-44		
4	15-29	Severely reduced GFR ± other evidence of kidney damage	
5	< 15	Established kidney failure	

Audit Recommendations

Element to be monitored	Lead	Tool	Frequency	Reporting arrangements	Acting on recommendations and Lead(s)	Change in practice and lessons to be shared
Incidence of Acute Kidney injury (Creat rise > 26.5) in post-surgical patients	Lead for the ALERT Team	Data Warehouse ICE Database	Monthly (via Alert Team)		ALERT TEAM CADS TCCA	
Readmission due to AKI	TCCA	CIS	Monthly (via Alert Team)		ALERT Team CADS TCCA	
Adherence to AKI guideline	Audit/ALERT	TBC	Yearly - 1 year post guideline implementation		ALERT Team CADS TCCA	

REFERENCES

- Department of Health (2009), Competencies for Recognising and Responding to Acutely Ill Patients in Hospital, *DH publications*, London

- NICE (2013), Acute kidney injury Prevention, detection and management of acute kidney injury up to the point of renal replacement therapy Issued: August 2013 NICE clinical guideline 169 guidance.nice.org.uk/cg169

- NCEPOD (2009), Adding Insult to Injury. A review of the care of patients who died in hospital with a primary diagnosis of acute kidney injury (acute renal failure)
- NICE (2007), Acutely ill patients in hospital, Recognition of and response to acutely ill patients in hospital. Issued July 2007, NICE Clinical Guideline 50 gudance.nic.eorg.uk/cg50
- Papworth Hospital NHS Foundation Trust (2012) Fluid Management Procedure, DN559.
-
- Papworth Hospital NHS Foundation Trust (2012) Management of Deteriorating Patient DN309

Further Document Information

Approved by Executive Director/local committee **(required for all documents):**	Alert Service Steering Group Fluid & AKI Group CPD Group Nursing Advisory Committee (NAC)
Approval date (*this version*):	19 Nov 2014
Approved by Board of Directors or Committee of the Board **(required for Strategies and Policies only):**	N/a
Date:	N/a
This document supports: *standards and legislation – include exact details of any CQC & NHSLA standards supported*	• Department of Health (2009), Competencies for Recognising and Responding to Acutely Ill Patients in Hospital, *DH publications*, London • NICE (2013), Acute kidney injury Prevention, detection and management of acute kidney injury up to the point of renal replacement therapy Issued: August 2013 NICE clinical guideline 169 guidance.nice.org.uk/cg169 • NCEPOD (2009), Adding Insult to Injury. A review of the care of patients who died in hospital with a primary diagnosis of acute kidney injury (acute renal failure) • NICE (2007), Acutely ill patients in hospital, Recognition of and response to acutely ill patients in hospital. Issued July 2007, NICE Clinical Guideline 50 gudance.nic.eorg.uk/cg50 • Papworth Hospital NHS Foundation Trust (2012) Fluid Management Procedure, DN559. • Papworth Hospital NHS Foundation Trust (2012) Management of Deteriorating Patient DN309
Key related documents:	DN538 Management of the Deteriorating Patient Procedure DN559 Fluid Management Procedure

Equality Impact Assessment: Does this document impact on any of the following groups? If YES, state positive or negative, complete Equality Impact Assessment form from DN507 Single Equality Scheme, and attach.

Groups:	Disability	Race	Gender	Age	Sexual orientation	Religious & belief	Other
Yes/No:	No	No	No	No	No	No	No
Positive/ Negative:							

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