

Improving the Management of Acute Kidney Injuries (AKI) at the East Lancashire NHS Hospital Trust (ELHT)

Background:

Acute Kidney Injury (AKI) is characterised by the rapid decrease in kidney function due to multiple causes. Ultimately, due to the lack of a definitive cure, early diagnosis and management are essential to prevent adverse health outcomes (E.g. CKD)

>12.8%

Mortality Rate in UK

≈10%

of deaths preventable

14,818

cases per million people (in Lancashire)

>£1 Billion

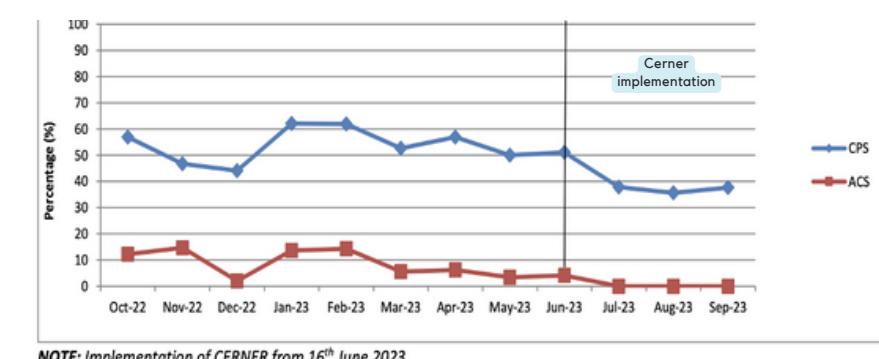
Annual cost to NHS due to AKI and AKI-related care

Key issues: Lancashire ranks among the top 5 regions nationwide with the highest AKI incidence rates. A national audit in the UK on AKI diagnosis and management found that 33% of patients lacked timely investigations, and 29% received inadequate management

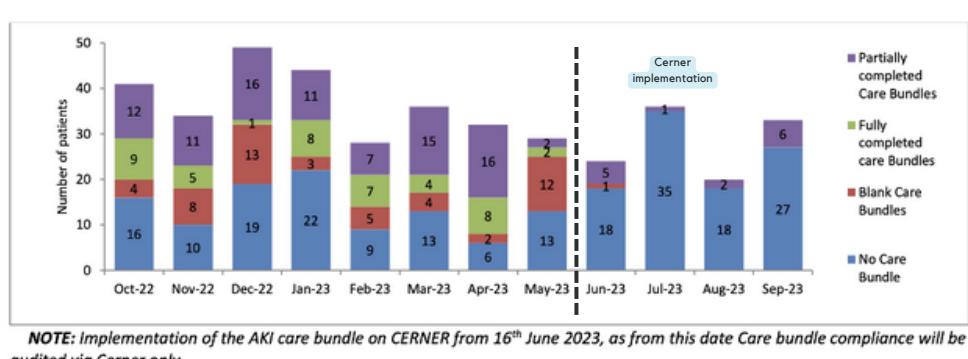
Problem:

AKI Care Bundle compliance significantly declined after the implementation of Cerner (A form of Electronic Patient Record system):

- Appropriate Care Score (ACS) dropped to 0%
- Composite Process Score (CPS) showed a sharp sustained decline



- "No Care Bundles" cases doubled from 37% to 89%
- "Fully completed Care Bundles" decreased from 17% to 0%



ABCDE APPROACH TO ACUTE KIDNEY INJURY (AKI)	
Important: (Please circle)	Is the patient in the last days and hours of life? Yes / No If Yes - Discontinue AKI Bundle
AKI IS NOT A PRIMARY DIAGNOSIS, PLEASE CONSIDER THE CAUSE	
Address Drugs:	<ul style="list-style-type: none">Omit all nephrotoxic drugs unless contraindicatedMedication Review by Ward PharmacistBeware of anti-hypertensives if Systolic BP <110mmHg
24 HOURS OF AKI ALERT A	<ul style="list-style-type: none">IV Fluid bolus if signs of hypovolaemia 250ml - 500ml of crystalloid. (Max 2ltrs IV Fluid in 2hrs) Check for signs of Fluid Overload following each fluid bolusMaintenance fluids assessed & prescribed where appropriateCheck Lactate and Bicarbonate Levels either ABG or VBGIf Hypotension persists discuss with ICU (See reverse)
4 HOURS OF AKI ALERT B	<ul style="list-style-type: none">Boost Blood Pressure: Volume status assessed
4 HOURS OF AKI ALERT C	<ul style="list-style-type: none">Calculate Fluid Balance:Commerce Fluid Balance Chart and maintain hourly fluid intake and outputConsider catheterisation if unable to measure outputEnsure urine output 0.5ml/kg/hr
24 HOURS OF AKI ALERT D	<ul style="list-style-type: none">Dipstick the Urine:Dipstick urine & document full results in patient notesLook for blood and protein—significant in intrinsic kidney diseaseIf blood or protein present send urine protein creatinine ratio and CONSIDER sending renal immunology - ANCA, complement C3, C4, anti GBM, immunoglobulins & consider myeloma screenCheck CK if rhabdomyolysis suspected
AS STATED E	<ul style="list-style-type: none">Exclude Renal Obstruction:Renal USS within 6hours if obstruction suspectedIf evidence of obstruction refer to UrologyRenal USS within 24hours if AKI not resolving / not responding to treatment
AT ALL TIMES, SEEK SENIOR HELP IF CONCERNED PLEASE TURN OVER FOR FURTHER ESCALATION ADVICE	

AKI Care Bundle (Employed at ELHT)

Aim:

Increase CPS to 60% by September 2025 (1 year)

Why Care Bundles Matter:

- Standardise evidence-based care
- Decrease AKI incidence & severity
- Reduce short & long-term mortality
- Enable earlier diagnosis & management
- Improve patient outcomes

Measures:

Proportion of AKI patients at ELHT who have a documented CB commenced for the management of their AKI

Process Measures:

- E-training attendance & completion rates
- Feedback survey (qualitative)
- Post-intervention competency (Likert scale)
- Monthly CPS & ACS reviews

Plan

Do

Act

Study

Plan

- Design e-training module in collaboration with IT & clinical educators
- E-learning contains:
 - Information on AKI diagnosis and management
 - Importance of completing care bundles
 - Short video tutorials on Cerner operability and how to access the care bundle
 - Post-module likert scale questionnaire and feedback

Study

- Review completion rates via the Learning Hub
- Analyse post-module Likert-scale questionnaire and feedback data to measure confidence, competence, and satisfaction post-training

Do

- E-learning will be uploaded onto the learning hub for staff to access, 4-week timeframe provided to complete module
- Staff notified through:
 - Email with direct module link
 - Posters with QR codes displayed in clinical areas

Act

If Successful:

- Integrate as mandatory e-learning + Annual refresher courses for staff and students
- "Train The Trainer" program for ward-based support
- Transfer knowledge to other conditions with care bundle use (E.g. Sepsis)

If Ineffective:

- Conduct semi-structured interviews + Reassess underlying causes
- Consider multi-intervention approach (E.g. E-alerts + training)

References

- Abebe, A., Kurniela, K., Belay, M., Kebede, B., & Wobie, Y. (2021). Mortality and predictors of acute kidney injury in adults: a hospital-based prospective observational study. *Scientific Reports*, 11(1). <https://doi.org/10.1038/s41598-021-94946-3>
- Bagshaw, S. M. (2015). Acute Kidney Injury Care Bundles. *Nephron*, 131(4), 247–251. <https://doi.org/10.1159/000437152>
- East Lancashire Hospital NHS Trust. (2023) ELHT Acute Kidney Injury Care Bundle Audit Measurement Report (Q2 September 2023) The Improvement Hub, East Lancashire Hospitals NHS Trust, United Kingdom
- Kerr, M., Bedford, M., Matthews, B., & O'Donoghue, D. (2014). The economic impact of acute kidney injury in England. *Nephrology, Dialysis, Transplantation : Official Publication of the European Dialysis and Transplant Association - European Renal Association*, 29(7), 1362–1368. <https://doi.org/10.1093/ndt/gfu016>
- NHS England. (2014). Factsheet: Implementation of NICE guideline on Acute Kidney Injury (AKI). In NHS England. Medical Directorate NHS England. <https://www.england.nhs.uk/wp-content/uploads/2014/02/rm-fs-10-4.pdf>
- See, H.-C., Che, J.-Y., Wu, C.-Y., Liao, H.-W., Huang, Y.-T., Liu, J.-H., Wu, V.-C., & Ostermann, M. (2023). Improvement of composite kidney outcomes by AKI care bundles: a systematic review and meta-analysis. *Critical Care*, 27(1). <https://doi.org/10.1186/s13054-023-04641-0>
- UK Renal Registry. (2023). Acute Kidney Injury (AKI) in England. In UKKidney. UK Kidney Association. https://ukkidney.org/sites/renal/files/AKI_report_202223_FINAL.pdf
- Zhang, S., Chen, Y., Zhou, F., Wang, L., & Luo, Q. (2024). Effect of care bundles for acute kidney injury: A systematic review and meta-analysis. *PLoS One*, 19(4), e0302179–e0302179. <https://doi.org/10.1371/journal.pone.0302179>