

# Biomarkers for assessing acute kidney injury for people who are being considered for admission to critical care: a systematic review and cost-effectiveness analysis

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## Plain English summary

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## Plain English summary

**A**mong people who are very ill or have undergone surgery, the kidneys may suddenly stop working properly. This is known as acute kidney injury. Acute kidney injury can progress to serious kidney problems and can be fatal. Currently, to decide whether or not acute kidney injury is present, doctors use the level of creatinine (a waste product filtered by the kidneys) in the blood or urine. However, creatinine levels are not a precise indicator and they can take hours or days to rise; this may lead to delays in acute kidney injury recognition. Novel biomarkers may help doctors to recognise the presence of acute kidney injury earlier and treat patients promptly. This work evaluates current evidence on the use of biomarkers for acute kidney injury with respect to clinical usefulness and costs.

We reviewed the current evidence on the use of biomarkers for assessing the risk of acute kidney injury among people who are very ill, and assessed whether or not the evidence was of good value for the NHS. We assessed the ARCHITECT® urine neutrophil gelatinase-associated lipocalin (NGAL) (Abbott Laboratories, Abbott Park, IL, USA), urine and plasma BioPorto NGAL (BioPorto Diagnostics A/S, Hellerup, Denmark) and urine NephroCheck® (Astute Medical, Inc., San Diego, CA, USA) biomarkers.

We checked studies published up to June 2019 and found 56 relevant studies (17,967 patients). Most studies were conducted outside the UK and investigated people already admitted to critical care. We combined the results of the studies and found that NephroCheck and NGAL biomarkers might be useful in identifying acute kidney injury or pre-empting acute kidney injury in some circumstances. However, studies differed in patient characteristics, clinical setting and the way in which biomarkers were used. This could explain why the number of people correctly identified and missed by the biomarkers varied across studies. Hence, we do not completely trust the pooled results.

We also found that acute kidney injury is associated with substantial costs for the NHS, but there was insufficient good-quality evidence to decide which biomarker (if any) offered the best value for money.

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## This report

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