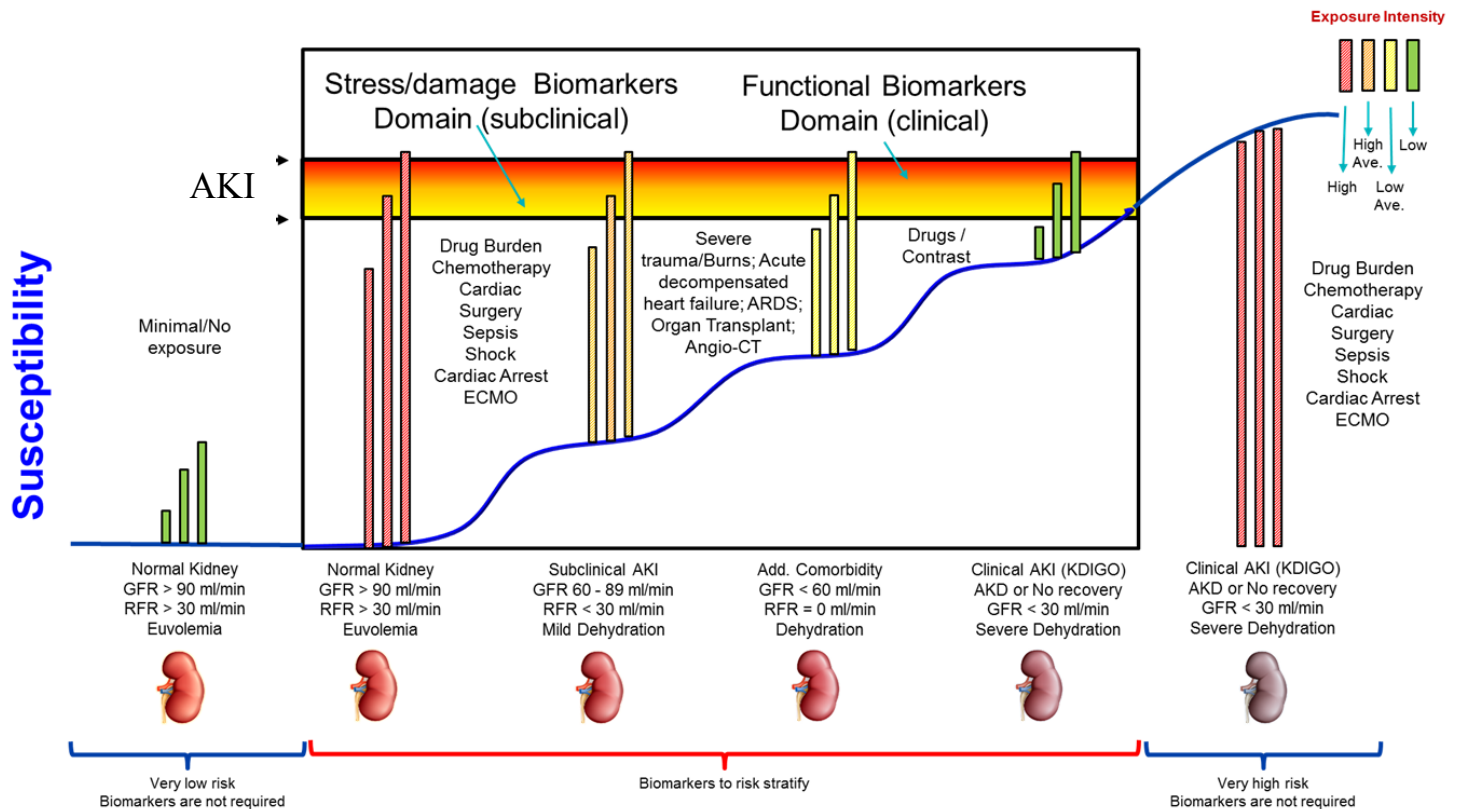


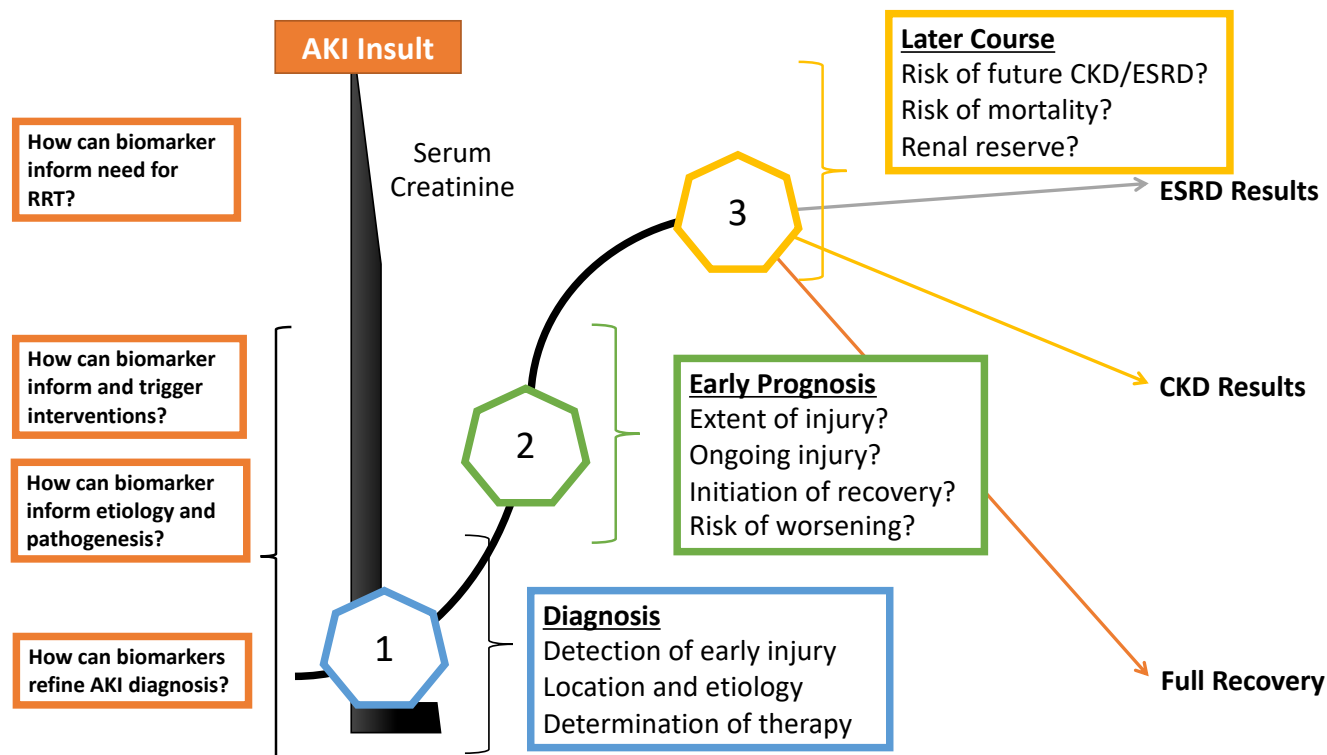
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Original citation: Acute Disease Quality Initiative 23, www.ADQI.org.

Figure 1. Renal susceptibility and level of exposure



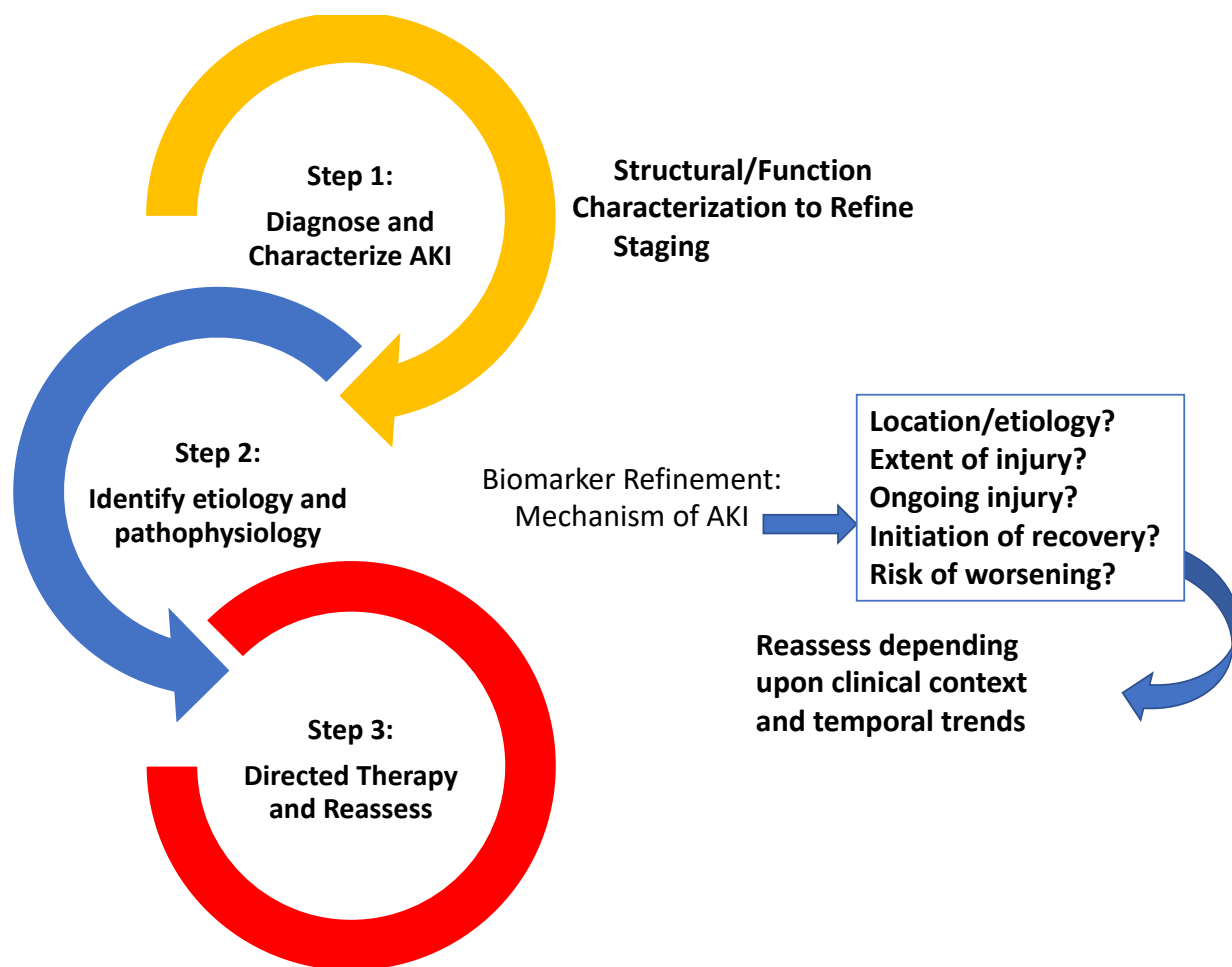
Legend: The risk of AKI depends on an individual patient's susceptibility and degree of nephrotoxic exposure. Age and comorbidity, including renal disease, increases the susceptibility to AKI. Renal exposure of varying intensity will affect patients differently based on this susceptibility. In patients with high susceptibility relatively low levels of nephrotoxic exposures can cause AKI. Stress / damage biomarker may indicate renal stress/injury before renal function is affected. ARDS = acute respiratory distress syndrome; AKI = acute kidney injury; CT = computed tomography; ECMO = extracorporeal membranous oxygenation; GFR = glomerular filtration rate; KDIGO = Kidney Disease Improving Global Outcome; RFR = renal functional reserve.

Figure 2. Utilisation of Biomarkers in the diagnosis of AKI for different purposes and at different times during the course of AKI



Legend: Different biomarkers and a combination of markers can help to refine AKI diagnosis by providing further information on the underlying pathophysiological process, etiology, and location of injury. During the course of AKI, different biomarkers can be utilized to identify risk of progression, presence of ongoing injury and/or likelihood of recovery/ need for RRT. AKI = acute kidney injury; CKD = chronic kidney disease; ESRD = end stage renal disease; RRT = renal replacement therapy

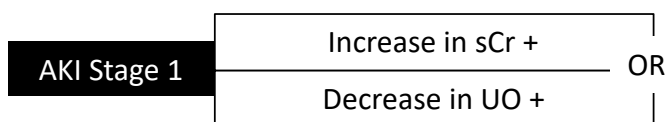
Figure 3. Steps in the Diagnosis and Therapy of AKI



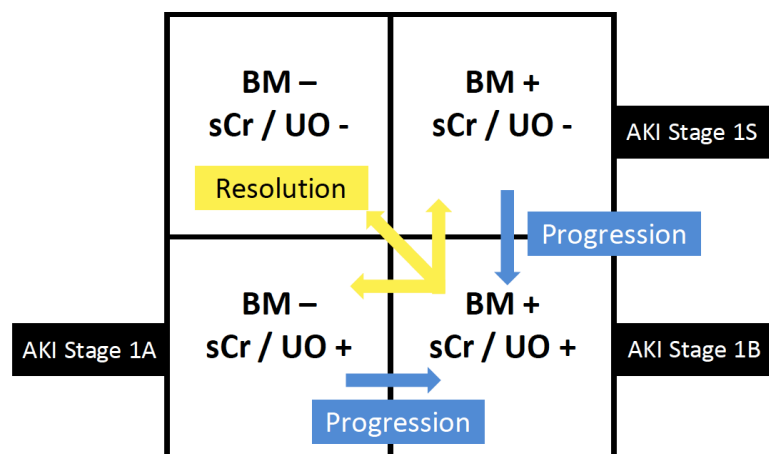
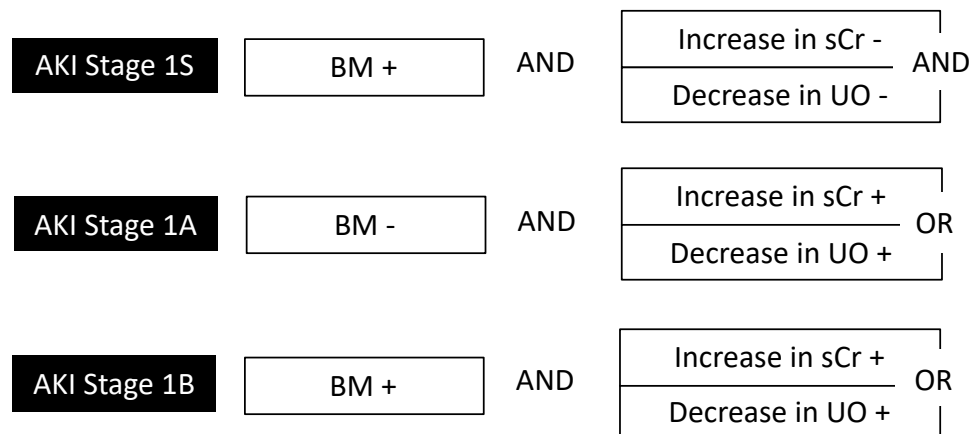
Legend: We propose a 3-step approach for incorporating biomarkers in the management of AKI: First to define diagnosis based on presence of damage and functional biomarkers; Second, to identify the etiology and pathophysiology utilizing biomarkers that can provide further information on the underlying pathophysiological process, etiology, and location of injury; Third, during the course of AKI, different biomarkers can be utilized to identify risk of progression, presence of ongoing injury and/or likelihood of recovery.

Figure 4. Refined Staging System for the Diagnosis of AKI

Current Diagnostic AKI Criteria



Expanded Diagnostic AKI Criteria



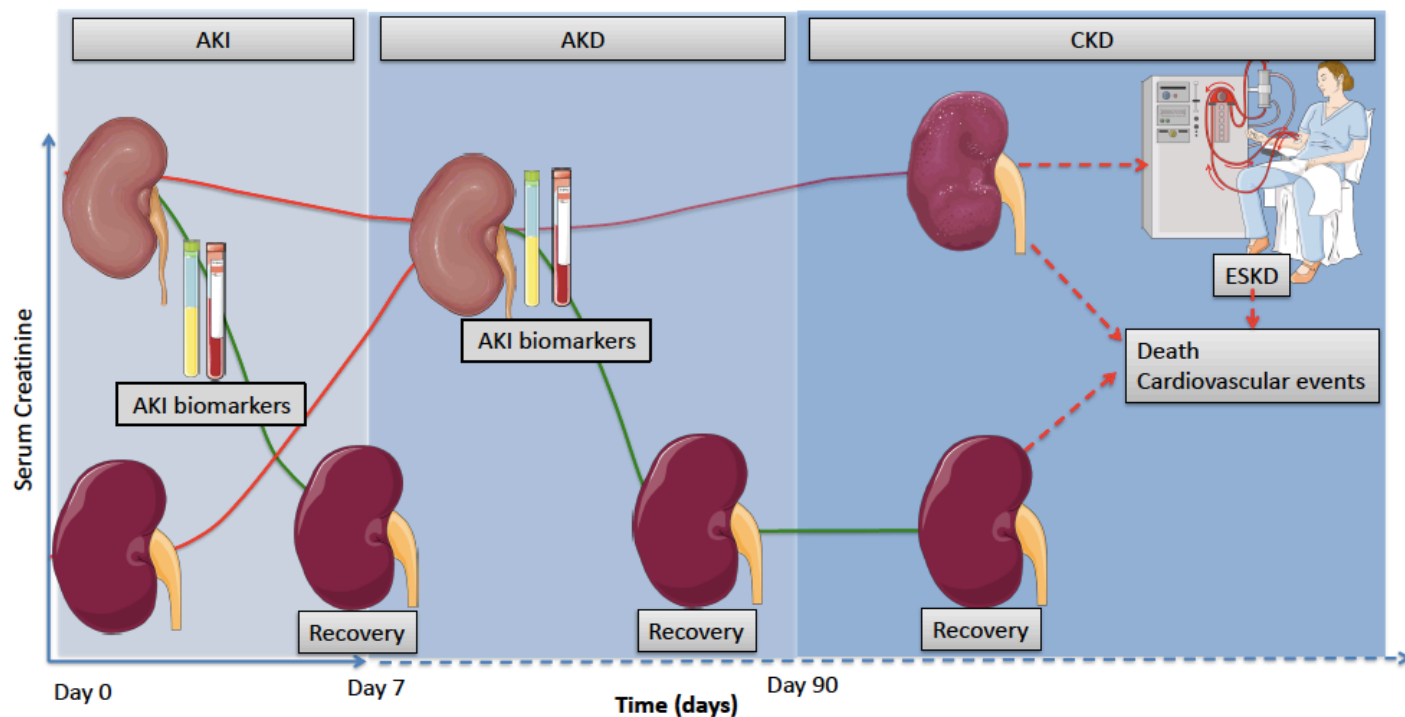
Legend: Patients with a biomarker of injury positivity without elevation/decline in serum creatinine and not reaching urine output criteria should be classified as **1S**. Reassessment should be performed according to patient clinical context and temporal trends. Patients reaching SCr/UO criteria, and no elevation on biomarker are defined as **1A**, and those reaching SCr/UO criteria with elevated biomarker are reclassified as **1B**. Biomarker positivity should be based on its mechanism and defined threshold. sCr = serum creatinine; UO = urine output; BM = biomarker. Reprinted from Acute Disease Quality Initiative 23 (<https://www.ADQI.org>), used with permission.

Figure 5: Proposed new staging of acute kidney injury including functional and injury biomarkers

Functional criteria	Stage	Biomarker criteria
No increased sCr $\geq 0.3\text{mg/dL}$ in 48h or to 150% by 1 week And UO not less than $<0.5\text{ml/kg/h}$ in any 6h period	1S	Biomarker +
Increase of sCr by $\geq 0.3\text{mg/dL}$ in $\leq 48\text{h}$ or 150% in <7 days and/or UO $<0.5\text{ml/kg/h}$ for $>6\text{h}$	1A	Biomarker -
	1B	Biomarker +
Increase of sCr by $>200\%$ and/or UO $<0.5\text{ml/kg/h}$ for $>12\text{h}$	2A	Biomarker -
	2B	Biomarker +
Increase of sCr by $>300\%$ (or $\geq 4.0\text{mg/dL}$ with an acute increase of $\geq 0.3\text{mg/dL}$) or UO $<0.3\text{ml/kg/h}$ for $>24\text{h}$ or anuria for $>12\text{h}$ or RRT	3A	Biomarker -
	3B	Biomarker +

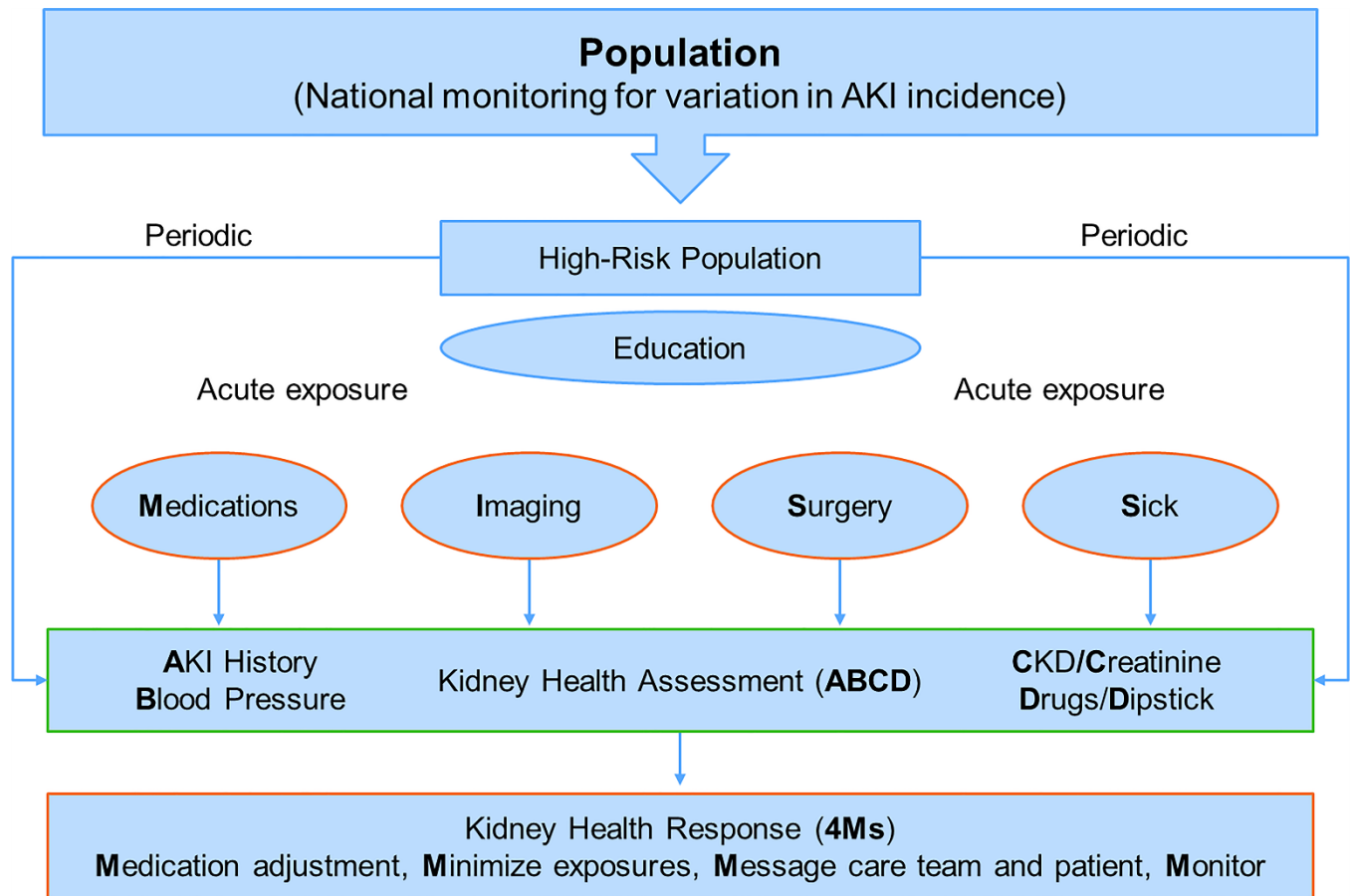
Legend: Proposed criteria for staging acute kidney injury with sub-stages based on biomarkers that reflect damage. The biomarker(s) to be used and appropriate cutoffs are the subject of ongoing resource. sCr = serum creatinine; UO = urine output; BM = biomarker; RRT = renal replacement therapy. Reprinted from Acute Disease Quality Initiative 23 (<https://www.ADQI.org>) used with permission.

Figure 6. Transition from AKI to recovery, AKD or CKD



Legend: Biomarkers of renal damage and function can refine the prediction of rapid recovery (i.e. transient AKI) or persistent AKI. Acute kidney disease (AKD) stage is assessed between 7 and 90 days after AKI. Scarce data suggest that new biomarkers of kidney damage and function can refine the prediction of poor outcomes (i.e. death, chronic kidney disease) at ICU discharge compared to serum creatinine. AKI = acute kidney injury; AKD = acute kidney disease. Images provided by smart.servier.com ; used with permission.

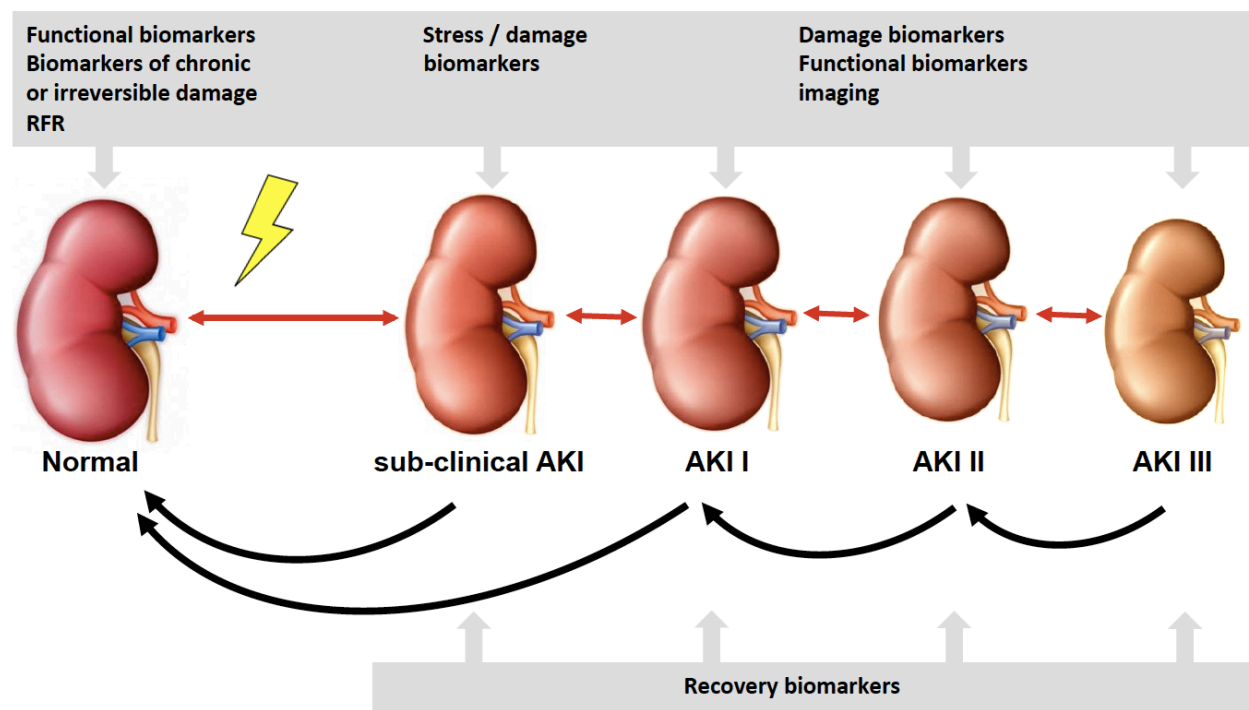
Figure 7. Kidney Health Assessment



Abbreviations: ABCD = AKI History, Blood Pressure, CKD/Creatinine, Drugs/Dipstick

Adapted from Basu RK, Wong HR, Krawczeski CD, et al. Combining functional and tubular damage biomarkers improves diagnostic precision for acute kidney injury after cardiac surgery. *J Am Coll Cardiol*. 2014;64(25):2753-2762.

Figure 8. Utilisation of AKI biomarkers during course of AKI



Abbreviations: AKI = acute kidney injury; RFR = renal functional reserve