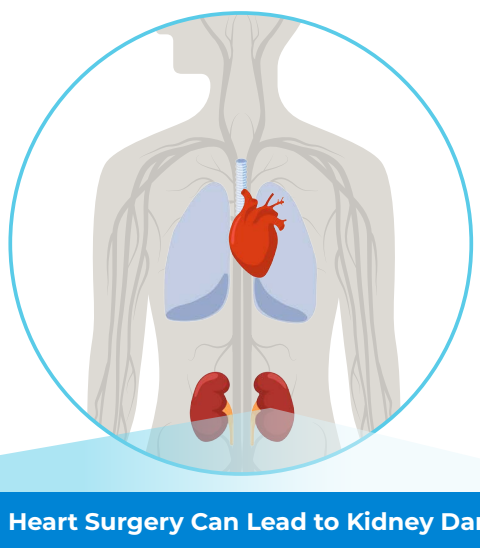
Cardiac Surgery-Associated Acute Kidney Injury (CSA-AKI)

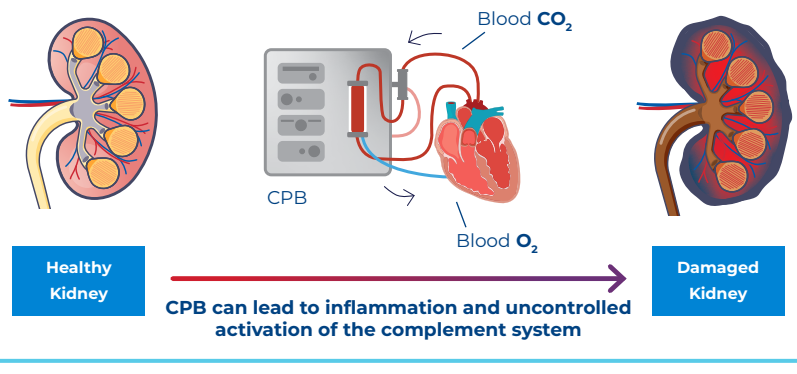
WHAT IS CARDIAC SURGERY-ASSOCIATED ACUTE KIDNEY INJURY?

Cardiac surgery-associated acute kidney injury (CSA-AKI) occurs when **the kidneys suddenly stop functioning normally** following heart surgery. **There is a higher risk of this complication following procedures that require a cardiopulmonary bypass (CPB),** which use a machine to perform the functions of the heart and lungs while blood is directed away from these organs during surgery.[1,2]

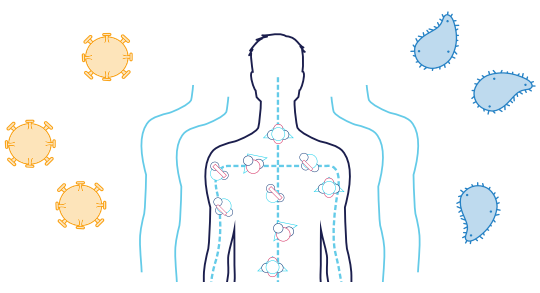
During this procedure, **tissues do not receive the appropriate amount of oxygen which can cause cell damage.** In some cases, the **return of blood flow "shocks" the cells,** leading to more damage. Studies suggest that **this cell damage is amplified** by inflammation and uncontrolled activation of a part of the immune system known as the complement system, resulting in CSA-AKI.[3]



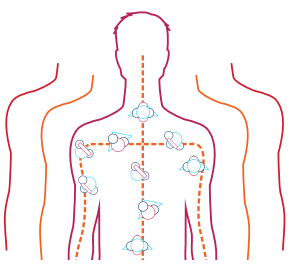
CPB During Heart Surgery Can Lead to Kidney Damage



THE COMPLEMENT SYSTEM



The complement system is a part of the immune system and is **essential to the body's defence against infection.**[4]



When the system is **thrown out of balance**, or dysregulated, these proteins can **trigger a dangerous, uncontrolled cascade of reactions** that attack cells and tissues resulting in **harmful inflammation** and the **destruction of healthy cells.**[4]

Diagnosed prevalence in adults is

~35K[5] **~20K**[5] **~20K**[5] **~7K**[5]

CSA-AKI can lead to **permanent kidney dysfunction** and **damage to other organs**, including the brain, heart, liver and lungs.[6,7]

One-fourth of patients develop AKI post-surgery.[8]

50%

People with chronic kidney disease (CKD) are at **higher risk of developing CSA-AKI. CSA-AKI occurs in up to 50% of people with CKD** who undergo cardiac surgery.[9]

People with CSA-AKI may experience signs and/or symptoms, including:[10]

- **Nausea**
- **Swelling in legs and around the eyes (oedema)**
- **Shortness of breath**
- **Chest pain or pressure**
- **Fatigue**
- **Confusion**
- **Decreased urine output**

CKD patients are more likely to experience **negative short- and long-term outcomes following surgery, including worsening of kidney disease, need for kidney replacement therapy** and sometimes **premature death.**[11,12]

HOW IS CSA-AKI DIAGNOSED AND MANAGED?

There are no early signs of AKI and symptoms often go undetected. CSA-AKI is detected **after damage has occurred** by a blood or urine test.[13,14]

Currently, there is **no way to prevent CSA-AKI.** Once kidney damage has occurred, **available treatments focus on supportive critical care,** dietary changes, glucose monitoring for diabetes and kidney replacement therapy, such as dialysis – a process that removes waste from the blood when the kidneys are unable to do so.[11,15]

In some cases, **kidney damage may continue despite supportive care**. For people with CKD, this may contribute to **faster progression to end-stage kidney disease**, requiring long-term dialysis and/or kidney transplant.[11,16,17]

People living with CKD who develop CSA-AKI may be at increased risk of **infection, stroke and heart attacks and require longer time on a ventilator** compared to other post-cardiac surgery patients, all of which could **prolong hospital stays.**[11]

There remains a need to **increase awareness of AKI** and **identify those people at high risk** prior to cardiac surgery to help achieve **the best possible post-surgery outcomes.**[14]

Content created by Alexion, AstraZeneca Rare Disease

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GL/UNB-U/0002 V1 10/2024

US/UNB-a/0712 V1 12/2024