

DEFINING THE PROBLEM (PROBLEM STATEMENTS)

CHRONIC KIDNEY DISEASE

1. Kidney Disease affected patients need a way to detect the presence of this disease at an early date to slow down or stop the progress of chronic kidney failure which not only reduces the fatalities but also the pain experienced by the patient while undergoing the treatment.
2. Patients need to follow a healthy diet by maintaining a balance of sodium, potassium, phosphorus, protein and fluids in the diet to keep the kidneys stronger, safer and healthier.
3. Symptoms of chronic kidney disease often don't appear until the condition has reached an advanced stage in which kidney function has become greatly impaired. However, with our project, we can detect whether a person is indeed in the risk of danger of CKD or not, even if there are no symptoms detected.
4. Suppose a person got admitted with severe kidney pain in a hospital. The doctor has to diagnose the problem as quickly as possible. After getting the required parameters, either the person is affected with CKD or not can quickly be decided with the help of our project.
5. With the parameters checked prior, there is no need of a person to seek the hospitals. We can diagnose the CKD, with our project, in their home itself.
6. Patients need to do regular blood test so that they can avoid kidney damage.
7. If you are a member of the African-American, American Indian or Asian-American races, you are considered to be at higher risk for chronic kidney disease. Those people should always have regular kidney check-ups.
8. Chronic kidney disease (CKD) means your kidneys are damaged and can't filter blood the way they should. The disease is called "chronic" because the damage to your kidneys happens slowly over a long period

of time. This damage can cause wastes to build up in your body. CKD can also cause other health problems.

9. Chronic kidney disease (CKD) is an irreversible condition that progresses causing kidney disfunction and then to kidney failure. It is classified by a GFR of <60mL/min for longer than 3 months.

10. Chronic kidney disease can affect almost every part of your body.
Potential complications include:

- Fluid retention, which could lead to swelling in your arms and legs, high blood pressure, or fluid in your lungs (pulmonary edema)
- A sudden rise in potassium levels in your blood (hyperkalaemia), which could impair your heart's function and can be life-threatening etc.

QUESTION	DESCRIPTION
Who does the problem affect?	It affects common persons having kidney disease
What are the boundaries of the problem?	Since there are no symptoms at the initial stage, doctors cannot identify this disease upon looking at a patient immediately. Testing Equipments and Laboratory Infrastructures are very less in most of the countries as compared to the persons acquiring CKD which acts as a constraints or boundaries to this problem.
What is the issue?	Due to the limitations associated with the identification of Chronic Kidney Disease, it causes deaths (in severe cases), Kidney Transplantation and Dialysis.

When does the issue occur?	When CKD is not detected at the right time, all these issues may occur. Factors driving the occurrence of CKD are improper health habits, genetic problems related to kidney.
Where is the issue occurring?	Most of the Kidney disease occurs at Renal Cortex which loses the ability to filter blood in a correct manner.
Why is it important that we fix the problem?	It not only improves the lifespan of a person suffering from kidney disease, but it also prevents the adverse effects such as cardiovascular attacks, development of ulcers due to high dosage of medicines administered by conventional treatment. The main stuff to note is conventional methods can keep the disease under control, it doesn't solve the problem from a grass root level. Cost of Kidney Disease Treatment is also a concerning factor which further stresses the need for solving this problem.
What is the Solution to this Problem?	ML Technique to Identify the Kidney Disease at an initial stage

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