

**Kianoush Kashani:**

## **Quality of Care in AKI, What are the Consensus, Recommendations from ADQI**

Speaker 1 ([00:00](#)):

Good morning or good noon time. Good lunch usually is a good practice to let people eat so that they're satisfied. But this time we won't have time to do that because we have a very busy program. It is my privilege and Dr Selby's privilege to introduce the session about quality metrics in AKI and CRRT establishing benchmarks. This is a compendium of the recommendations of ADQI 22 meeting and we will highlight some of the practical aspects of implementing a quality program for AKI and CRRT and Dr Selby from the University of Nottingham, and I will have the privilege of chairing the session. So let me first introduce Dr Kianoush Kashani a very good friend from Mayo Clinic. He's going to initiate the conversation about what are the consensus recommendations from ADQI.

Speaker 2 ([01:14](#)):

Speaker 2 (01:14): It's a great honor to be here. I haven't missed a CRRT meetings since I started my nephrology fellowship in 2005 so I'm a veteran of this meeting. I am really honored to be part of the discussing group. So the topic that was assigned to me is a summary of what the consensus group decided to do. First of all, we would review what ADQI goals is a little bit. So goals of ADQI or Acute Disease Quality Initiative that started around 2000 is to provide an objective dispassionate distillation of literature as well, doesn't have any of our emotions in it and describe current state of practice, diagnosis and management of AKI and dialysis. 21 prior ADQI focused on multiple aspects of management of acute kidney injury and dialysis along with critical care. ADQI 22 which was held right after ASN in October 28th to 30th in 2018, in San Diego, California convened by multiple specialists including nephrology, critical care, advanced clinical practitioners and nurses, pharmacy, epidemiologists, biostatisticians and medical informaticians, to identify quality improvement processes, the knowledge gaps that exist, and also some research agenda. This is the group, many of which are in this room. I see Dr, Zarbock, Dr Chung, Dr Macedo, that provided wide variety of views on this particular topic. So ADQI has iterative process. It starts from congress literature review, their results coming up with the questions that are pertained to that particular ADQI. Following that the each group that has

assignment, review the question and try to come up with the key recommendations. These key recommendations, come to the meeting which was held in October, go through 4 iterative process of discussion with the whole panel and then group discussions, until consensus in each group is reached and the result is usually distributed as a form of a paper and presentations like this. For ADQI 22 we divided the group in five different groups based on the continuity of care that acute injury patients require.

Speaker 2 ([03:49](#)):

First of all, we looked into primary prevention of acute kidney injury at the community level and also at the hospital level. Those who walk in the street have history of hypertension, have history of diabetes. They obviously have very high risk of acute kidney injury with exposure that they can encounter in the community. Also, those who come in the hospital, they also could be very high risk for acute kidney injury. So two first groups were dedicated to primary prevention. Third group was dedicated secondary prevention. When acute injury happens, how we can mitigate the severity and progression of acute kidney injury and how we can avoid complications like volume hyperkalemia and so forth. Group 4 that professor Bagshaw and my colleague Ms Mottes were discussed, focus on renal replacement therapy and then group five, focus on tertiary prevention of acute kidney injury.

Speaker 2 ([04:48](#)):

These are patients who had acute kidney injury developed already. Then this group focus on how we can follow these patients up after discharge from the hospital to mitigate the longer term **vose** outcome for these patients. Like any other quality improvement project, there are many projects that we can consider doing as of today in each institution we thought taught that it is important to identify a path towards successful quality improvement projects. So the first step in quality improvement projects is to prioritize, identify a project that could be done with the minimal amount of effort, with highest amount of impact as it says, just do it projects. Also projects that are important that they have higher impact and they have high effort. Do you need to plan for these projects but there are **water** to be done based on your resource availability, based on all the factors that you consider in your program.

Speaker 2 ([05:46](#)):

There's some projects that have very low impact. They need a lot of effort. These are projects that you really need to postpone for later day. You don't really need to focus on those, so prioritization is very important step. Then going to literature to see what's the syndrome of interest is benchmark or what are the best practices to identify the goals of your quality improvement project. Look into your project, your program, baseline data to be able to identify where you are in the best practices. Are you on par with the best practices that are published in the literature or you have findings in your baseline data that provides you targets for approach. These could be done in a form of root cause analysis, fishbone or Pareto chart or other process mappings. Then you need to strategize your improvement, looking to the definition of your goals, doing some measurement and then improvement ideas so you really need to come up with some ideas that could translate to improvement in quality.

Speaker 2 ([06:51](#)):

Then quality improvement techniques could be used like PDSA processes or other techniques that are defining quality projects in order to improve the practice or target of your interest in each program. Then look into cost effectiveness and analyze the importance of your outcomes and then distribute findings not only to your ward or your ICU, but also other ICUs in your institutions, the institutions neighboring you or institutions across the globe in a form of paper or presentation. We also know that acute kidney injury is does not start from a cardiovascular surgery in ICU. Acute kidney injury starts from community. We know that our patients that build up risk for acute injury over the course of time while they are walking in the community setting, so acute kidney injury is a continuum starts from a different patient population. In our community. These patients develop acute illness. They come to the hospital.

Speaker 2 ([07:54](#)):

You need to identify those that are higher risk. Try to mitigate the risks. Then some of them develop acute kidney injury, how you can limit their severity or progression of acute kidney injury and then some of them will need renal replacement therapy, how to provide a safe low cost dialysis for these patients and efficient and they eventually some of them recover from dialysis or recover from acute injury and are going back to the community. How do you follow these patients? So it's a continuity of care. It's not once one sided view. So the first group, which was a community healthcare standard for acute injury question was

focused on roles and responsibilities of patients, clinicians and healthcare systems. Healthcare systems data concluded healthcare systems and clinicians should identify populations and patients at risk of AKI and implement monitoring or preventive interventions to decrease AKI risk

Speaker 2 ([08:51](#)):

This may seem very simple to you, but majority of institutions, majority of healthcare systems, acute kidney injury is a low priority for them. You want to kind of make sure that as nephrologist, as intensivist, as clinicians or nurses, we bring this up in a surface to avoid further development. So we need to identify patients that are high risks. Development of a risk stratification strategy for the communities have been discussed in ADQI 18, in Hyderabad, we came up with a list of risk factors including social economy call, access to insurance risk factors related to environmental factors, how the care is provided, process of care, inherent risk factors, and also, exposures including patients. For example, in tropical areas, they get a infection, patient in North America, they get diabetes associated in acute kidney Injury or sepsis associated. So identify how risk patient population depends on where you live and how you live.

Speaker 2 ([09:57](#)):

So after identifying this, how should AKI high risk population be monitored? They recommended high risk patient population should at least have something they call kidney health assessment or KHA at least 30 days prior to and again, two or three days after exposure to acute injury risk factor. This needs to be tailored with clinical context. Also clinical clinician judgment and healthcare system resource availabilities. So they recommended using ABCD for this particular kidney health assessment, including reviewing AKI histories or looking into all the patients who have CKD due to AKI or they are suffering for acute kidney disease. Look into their blood pressure, treat hypertension and hypotension. Look into history of CKD measuring proteinuria vision into the base serum creatinine to identify the stage of chronic kidney disease they are on, reconcile their medications, avoid nephrotoxin and looking to dipstick urine, which is very cheap and a non-expensive way of identifying patients that are at risk of Acute Kidney Injury

New Speaker ([11:07](#)):

if you find 4 plus proteinuria on a patient that walks in the street, that patient and population already consider high risk for acute kidney injury Then there are acute

exposures they use MMS as the mnemonic for this medication. Imaging surgery. Imaging means contrast media surgery and sickness if they get sick. What is considered acute exposure? So 30 days prior to planned, acute exposure or two or three days after planned and unplanned, acute exposure should be considered for kidney health assessment. Preventative strategies for high risk AKI was summarized as clinicians reviews, kidney health assessment before a plan or immediately after implant acute exposure kidney health assessment should follow with kidney health response after acute exposure we need to raise awareness among patients and population related to acute kidney injury and coordination between all stakeholders need to be done. So kidney health assessment they use for Ms mnemonic medication adjustment for those patients who have high risk of acute kidney injury and are exposed, minimizing exposures, message to care team and patients.

Speaker 2 ([12:22](#)):

So patients need to know that there is a risk that they may need to measure the creatinine next day or the day after and also their providers, local providers to order such tests and also monitoring kidney function output is very important. So you see these figures that we will discuss further in planetary session tomorrow. This summarizes quality indicators for each group and we decided to go for two different sections. The white section are always on **resist** limited areas that they do not have availability of a lot of resources versus a blue section that is resource sufficient. And we divided that in structure, process and outcome. So for community for example, availability of documentation or personnel that can document as a structure, kidney health assessment is the process and development of AKI in a community is outcome for example. Now group two was focused on primary prevention of AKI.

Speaker 2 ([13:25](#)):

These are patients that come to the medical encounter. They get admitted in a hospital but they do not have AKI yet so they are considered high risk for AKI potentially. So how then and when should hospitals high risk patients be identified? So the group reached a consensus as all patient that the hospital admission should be screened for AKI risk. This could be done by electronic records, could be done manually. However, your institution that allows you to do, you can proceed. All AKI at risk patient should at least have a serum creatinine measured urine dipstick or urine analysis done and urine output measured, and

also complimentary tests for potential depends on the diagnosis, the clinical judgment and **resource availability** It needs to be done to avoid further progression of this risk among these patients. All patients need to have periodic risk assessment. So you cannot say I reevaluated outpatient admission, I'm done. And this is, taken care of. If you identify high risk patients, even if they're not categorize high risk patient, they may become high risk based on their exposure. So if a patient comes with cholecystectomy and they do cholecystectomy which is low risk procedure, but next day get septic due to **bile leak**, then you may consider as high risk patients. So this needs to be done through their admissions.

Speaker 2 ([14:53](#)):

Also they looked into preventive measures, they recommended early correction or mitigation of context specific modifiable AKI risk factors should be considered for all high risk patients. Again, this seems very simple but it is very important. Majority of us would not have a systematic way to approach this.

Speaker 2 ([15:14](#)):

Also quality indicators for AKI, how do you know that you are taking a good care of patients that are at risk of AKI? So we decided to come up with a series of quality indicators to evaluate that. So on monthly basis or yearly basis, you review all these numbers. Say that in last year I had a better outcome than this year, so the indicators included proportion of patients screened for AKI risk among all admissions, proportion to identify AKI high risk patients among all screened patients, proportion of AKI, higher risk exposure among all hospitals population and all high risk patients, proportional patients who received an appropriate intervention around the high risk exposure and proportion of patients who develop AKI among all admissions and all high risk patients.

Speaker 2 ([16:03](#)):

Next question that they had was about utilization, institutional quality indicators for AKI risk profiling, so quality indicators should be reviewed and utilized to identify areas of improvement and action. These quality indicators could be defined based on each institution. Frequency of reporting should be dependent on local resources. If you a lot of resources dedicated to that, do it every week, every month. If you don't have enough resources, you can do it on at least annual basis. Again, this is quality indicators based on structure, process, and outcome for group two. In the interest of time I passed these figures just I'm mentioning

that this will show up in a paper, hopefully will be published soon. Group three focus on secondary prevention. These patients already have acute injury, met all the criteria met they have high serum creatinine or low urine output and what can we do to provide quality care for them. So key consideration for developing quality program among patients with acute kidney injury is to maximize the proportion of patients who undergo context appropriate timely evaluation and cost saving interventions. Next question was limiting the duration and severity of AKI. These patients have AKI stage one then they go the go to stage two and three need dialysis. How we can mitigate that to avoid further progression. Implementation and reporting of the proportion of patients that receive timely and diagnosis appropriate interventions. Compliance or adherence with these interventions should be measured, reported and reviewed on at least annual basis. Otherwise, you would never know how you're doing in comparison with the best practices or another hospital in your town or in your state.

Speaker 2 ([17:53](#)):

Third question was key consideration for reducing complications of AKI like volume overload, Hyperkalemia, acedosis things that can happen during acute kidney injury episode. Prevention of avoidable AKI related complications require monitoring, reporting and implementation of risk mitigation. So for example, if you have a patient with AKI before that patient, develops hyperkalemia. You can start low potassium diet or you can start a regiment for diuretics to increase potassium excretion. Depends on what you decide as context specific appropriate intervention. So the group three decided to, summarize their findings in the three categories of diagnostic evaluation, limiting severity and duration of AKI, prevention of avoidable AKI, complications in a three section of recognition, action and results. I just reviewed the first column, diagnosis, evaluation. You really need to kind of recognize patients with AKI as early as possible. You can't wait until patients really in uremic for four hours and they become uremic frost. You really need to identify these patients earliest stages in order to provide appropriate intervention, context appropriate evaluation. What do you do? Do you biopsy all of them or do you do ultrasound on all of them? You need to be cost saving and appropriate for each context and improved frequency of context appropriate diagnostic evaluation, improve recognition of causes specific AKI. These are the rates that you can follow. So every month you would know how many of patients underwent appropriate intervention and how many of them received appropriate care.

Speaker 2 ([19:35](#)):

Group four was mainly focused on renal replacement therapy. They had four questions. How should the quality of acute renal replacement therapy be monitored, evaluated, reported. They recommended quality indicators should integrate structure, process and outcome indicators. I'm sure that the next speakers will focus on this further. This has to be done regardless of where renal replacement therapy is offered in ward or intensive care units.

Speaker 2 ([20:07](#)):

Second question was about their restructure. They looked into specific targets that they provide these type of care clinicians, nursing staff and allied health professionals and they looked into capacity and expertise of providing acute renal replacement therapy in a safe way and identify a responsible team to review all data on periodic way, which at least should be annual basis to look into how acute RRT in each program should be considered as a structural quality indicators. Then they moved to process quality indicators. They said that incorporate methodologist to standards, procedures and protocols. Protocolizing acute renal replacement therapy is associated with less medical errors, improvement in quality. This has to increase efficacy and consistency, safety and also save costs. This has to be specific for each renal replacement therapy modality. And finally, fourth question was minimum outcome indicators. Patient centered outcomes should be considered as main outcomes that you are looking at including provider, patient satisfaction, mortality rate, quality of life among survivors, dialysis liberation rate and healthcare, economic outcomes.

Speaker 2 ([21:29](#)):

Last group, group five, focus on tertiary prevention, which is patients that already had acute kidney injury. Now they are, going back to the community, they may need dialysis in the community or they may recover from AKI, be liberated from dialysis or never needed dialysis. So this group looked into what is appropriate post AKI acute kidney disease care. They recommended healthcare systems need to ensure appropriate followup, which mostly is not done for acute kidney injury, is done for acute coronary syndrome by is not done for acute kidney injury. Quantitate the proportion of patients who need post AKI or AKD follow up and evaluate quality of care provider to those who received care.

Speaker 2 ([22:14](#)):



Key elements of appropriate post AKI care include a structure needed personnel and resources. So you need to go to your administrators, ask for those resources, process of followup, who should be followed by whom, what should be followed, where this has to happen, when should be happening and why and how should be done. Outcomes should include the chronic immune disease progression continued or new form of dialysis and mortality should be considered. So they came up with this wonderful graph that gives you a template of how you can potentially decide following these patients. So depending on severity of acute kidney injury or acute kidney disease, patients could be followed by non nephrology care providers or nephrology based care providers. So for example, patients have stage one AKI for one day. Creatinine completely goes back to baseline and they're healthy at the baseline. They come in and they just have a little bump in their creatinine recover in one day. They can go in three months later, they can go their primary providers. But if a patient comes in with CKD stage four at the baseline or develops a need for renal replacement therapy, even if it is liberated from dialysis, they may need a shorter time to follow up and also follow up by a nephrology care provider.

Speaker 2 ([23:39](#)):

They also provided framework for care bundle among these patients. Ramps for patients who have acute kidney injury, didn't require dialysis, including measuring kidney function after discharge advocacy, communicating with all care providers and patients, educating them. Medication reconciliation, avoiding the nephrotoxins, evaluation of pressure to avoid hypertension and hypotension and treat those and avoiding sick day or acute exposures. A chance for recurrence of AKI, They also recommended WATCH ME a care bundle for patients who needed dialysis, including weight assessment to avoid volume overload or depletion evaluation of their dialysis access, teaching them how to deal with complications of dialysis, evaluation of clearance, avoiding hypotension during dialysis in between dialysis session and reconciling medications. So in summary, we have identified five stages of AKI care spanning the clinical spectrum. We proposed quality indicators to develop, measure and study across the structure, process, outcome and patient experience.

Speaker 2 ([24:52](#)):

domains. Goal is to use these recommendations to improve the quality of AKI care and thus to improve patient outcomes. More research is needed to identify

appropriate targets. So this is a timeless document. This doesn't mean that we have to stick with the current guidelines. If guidance renews, then you need to come up with a new set of strategies to improve your care to that level. I had a pleasure to work with professor Rosner from the University of Virginia and a professor Haas from Germany to organize this meeting, along with the founders of ADQI group, Dr Kellum, Professor Ronco, Professor Mehta and Professor Bellomo, I thank all the sponsors. Sponsors did not have anything during sessions. They just stayed as silent observer. Baxter LA Jolla, Astute medical, MediBeacon, AM- Pharma. Abbvie. We appreciate their support. With that, I thank you for your attention.