

Technology & Innovation in Pediatric ICUs: A Pioneering Look at the Middle East

SPEAKERS

Kholoud Said, Abdul Rahman Al Daithan, Omar Al Defaei, Manu Sundaram

Manu Sundaram

Welcome to the WFPICCS world PICU Awareness Week 2025, podcast series. I am Dr. Manu Sundaram, an attending physician at Sidra Medicine in Doha, Qatar. This is at a time of the year to recognize the incredible work done in pediatric intensive care units around the world. This year, we are focusing on a crucial theme: technology and innovation in the PICU. The goal is to highlight how PICUs everywhere, from cutting-edge hospitals in major cities to resource-limited settings in remote regions, are driving change. Innovation in pediatric critical care isn't just about the latest high-tech equipment; it's about creative problem-solving, enact ability, and making a difference in children's lives. With me; I have three brilliant speakers from the Middle East region. I'll let the speakers introduce themselves. So a handover to Dr. Omar Al Defaei to introduce himself.

Omar Al Defaei

Hello, everybody. My name is Omar Al Defaei. I'm an intensivist from the Royal Hospital. I have an interest in sepsis, mainly sepsis screening tools and medical simulation. I am already working in Musat Royal Hospital.

Manu Sundaram

Thank you. Dr. Omar, next I have Dr. Abdul Rahman Daitan from Kuwait, and I'll let him introduce himself.

Abdul Rahman Al Daithan

Thank you, Dr. Manu. I'm Dr. Abdul Rahman Daitan, I'm a senior specialist in pediatric critical care in Kuwait Oil Company. I'm interested in developing the local PICU registry as nationwide for Kuwait.

Manu Sundaram

Thank you Dr. Daitan; next, I have Dr. Khaloud Said from Oman.

Kholoud Said

Hello, everyone. My name is Khaloud. I am a pediatric intensivist working at Royal Hospital. I have a special interest in acute non-invasive ventilation, and I going to talk about the ICEMAN approach in initiation of non-invasive ventilation.

Manu Sundaram

Thank you all for your kind introduction. I would love to hear in brief, an overview about the landscape of pediatric intensive care in your country.

Kholoud Said

Okay, so our PICU includes medical, surgical and cardiac ICU. Our centre is a referral centre in the country, and our annual admission to the medical ICU and high dependency is around 1600 patients. We receive a total of 2000 patients combined from medical and cardiac admissions. The centre receives patients with complex backgrounds who require diagnostic assessment and treatment from all over the country. And our PICU does all types of respiratory support, from high-flow nasal cannula to high-frequency oscillatory ventilation, CRRT, plasmapheresis, nitric oxide, and ECMO for cardiac cases.

Manu Sundaram

Thank you, Dr. Khaloud

Omar Al Defaei

We have also at [inaudible] we have an ER was actually seeing around a year around more than 5,000 cases in the ER, and also we have in the cardiac ICU we're actually operating around 550 cases per year.

Manu Sundaram

Thank you, Dr. Omar. Now, and now let's hear from Dr. Abdul Rahman from Kuwait.

Abdul Rahman Al Daithan

Thank you, Dr. Manu. So, as for Kuwait, we a total of seven medical pediatric intensive care units that admitting around 2000 to 2500 annually, with different kinds of care. Some have medical, some take medical and surgical. Initially, we lacked the data that's going to help in developing the guideline protocols that need to flourish from the data that each units have. And with building registry, we were able to reach that point.

Manu Sundaram

Before we get into the individual projects, I would like to hear briefly from our three speakers as to what drives innovation. [Inaudible] to Dr. Kholoud first.

Kholoud Said

This is a very interesting question. Thank you, Manu. So, in my opinion, what drives innovation is your needs assessment. And the needs assessment comes from the reviews of the unit's key performance indicators, morbidity and mortality reviews, and clinical discussions around medical cases. And I think when an issue is identified in the pediatric ICU, the team tries to come up with an innovative solutions. So I think, you know, having a problem drives people to try to solve it. So, for example, in our unit, a home ventilation team was created following morbidities related to accidental dislodgement of tracheostomy. The second factor that probably drives innovation is implementing a significant result from a previously published work. An example of that is implementing sepsis bundles from surviving sepsis [inaudible] guidelines, 2016 and 2020. And I think what assists with the implementation process is having a trained group within the intensive care on patients' quality and safety. And for us, we were privileged to have a trained team of physicians and nursing on system improvement. And that enabled us into changing ideas to quality initiatives.

Omar Al Defaei

So I think what drives innovation, for me, is, actually, creativity. So, we want, actually, to create something new. Okay, like in our case, we actually elected to use something new; that's, actually, it is a screening tool. And the other, actually, that drives innovation is, actually, curiosity. Like, the thinking that if you, to use something new, if you create something new, it's actually [inaudible] the data [inaudible] in a situation. [Inaudible] This is something, actually,, that could drive innovation. That's, for me actually, the major two things that can drive innovation in our setting.

Abdul Rahman Al Daithan

So, what drives innovation is that I don't want to be the person with opinions. So, as Dr. Deming was mentioning, without data, you're just another person with an opinion. So if you're going to say this is important, or this is a top priority to be taken care of, regarding policies, suggestions, something outbreaks, you need to have data to support your opinion. So it's not become just an opinion. It's become something that people listen to you and give it that, as I remember from Dr. Kotter's framework, urgency is usually the first step. So, urgency will provide you with the sense you need to innovate. You need to invent something to help you realize that your opinion is not just an opinion but a data-driven decision. So, to reach that, you need to be innovative.

Manu Sundaram

Thank you very much. Dr. Abdul Rahman, let's get to the meat of the discussion. Let's start with sepsis, a time-critical diagnosis where every minute counts. Dr. Omar, your team in Oman has developed and implemented a sepsis clinic tool that integrates with your clinical workflows. Tell us what led to its creation.

Omar Al Defaei

This creation actually came up from a group we have. We name it the sepsis improvement team, and this team consists of paediatricians and nurses. We came up with this project after having an increased sepsis rate and mortality related to sepsis, where our data exceeded the worldwide benchmark. This project started earlier in 2018 but was actually abandoned because of COVID; we re-initiated the program to lower the benchmark of sepsis, such as incidents and mortality related to sepsis. And we came up with a program that used to screen all cases of sepsis to recognize and manage them earlier, and that's how this program started.

Manu Sundaram

Can you tell us about this tool that you created?

Omar Al Defaei

Sure, this tool uses our internal servers. We use a web page using the internal server; this page consists of three main criteria. The first is the patient's complaints, whether fever or a new infective symptom. The next column is the patient's background, including whether the patient has a chronic illness or recently received chemotherapy. This child or this patient has a central line in place, which makes it a risk for sepsis. The third column consists of red flags, mainly the signs that patients exhibit, like fever, tachycardia, bradycardia, mottling of the skin, and blood pressure. These are the three main criteria we included in the screening.

When entering this, the nurse will find certain columns where she needs to put the patient's MRN number. Also, she must put the staff number, the place where she did the screening, and the time and the date, which will come automatically. Or she can change the time if she enters it later on or within one hour of the screening. After the nurse opens the tool, she ticks the criteria or what the box indicates for the patient. Three main screens are coming after that. So if the patient, for example, is screened and he is not septic. After she entered all the criteria needed, it went to a screen that is the patient was not septic, so she needed to do the screening again if the patient exhibited new symptoms, or the next day if the patient admitted, but if the nurse she put the criteria and the patient turned to be high risk. A pop-up screen will come out. It will indicate that the patient has a high risk of sepsis. So it will come already with an order. This screening should be done every shift so that every eight hours, we don't have to wait for the new symptoms. The screening will be done every eight hours. Or if new symptoms arise, like fever, mottling of the skin, or other red flags.

On the other hand, if the patient is septic and she entered all the data, the patient turned out to be septic. A pop-up screen will appear, indicating that the patient is having sepsis. A link will appear; after clicking that link, it will go to a new page where the management plan will be there with the patient's MRN. The sepsis management plan will be printed on that paper along with the staff number and location of the patient, i.e. the ward, in the ER, or HD. And then the page is self-informative. So, it will tell the nurse what to do and whether to call the consultant or the registrar. And then, after the registrar comes, he will confirm whether this is sepsis or not. Then he will start management, like collecting the labs and starting antibiotics, boluses or inotropic support. And also indicate when to call the ICU. This is, in short, how they get the screening done and the screen's outcome.

Manu Sundaram

Thank you, Dr. Omar. Is this done in addition to your electronic medical records?

Omar Al Defaei

Yes, it is actually in addition to it. We haven't integrated it yet with the EMR because we use the SHIFA system. It is not integrated there because sophisticated software is needed to install it. We are hoping it will be incorporated into the coming system. It is now working parallel to that system.

Manu Sundaram

Thank you very much. How has this tool changed the timeline for diagnosis and intervention in sepsis?

Omar Al Defaei

Our data is really positive from that perspective. We decreased the intervention time from five hours to within the golden hour to treat sepsis. So, like in the ER, our data shows that from seeing the patient in the triage to starting treatment, we reach up to 30 minutes now, from triage to starting management, or cannulas, fluids, and antibiotics. Our data showed that in the wards, from the time of detection of sepsis to implementation of management, it took 45 minutes; this is how it changed our intervention and improved sepsis management. Our data showed a reduction in the PICU admission rate to less than 15% in the last six months, from July 2024 to December 2024. Also, our data showed that, in the previous six months, our mortality rate due to sepsis was less than 10%. we are doing great from that perspective. This is how the screening changed the timeline from diagnosis to intervention and outcome and showed that you are doing well, from that perspective, with promising areas for improvement from our screening tool.

Manu Sundaram

Thank you very much. What has been the staff response? And how do you manage false positive outlooks?

Omar Al Defaei

We started this in the screening process in October 2023, and our aim was to make it or build a culture, not to force the nurses to do it. Our perspective, or our objective at that time, was that if we were to improve the culture regarding sepsis, regarding the importance of sepsis and how it turns the outcome, the nurses would do it without our force, or they would do it by themselves. This changed our view of sepsis, so we spent a lot of time teaching the nurses how important it is to detect sepsis and treat sepsis in time, how we changed the admission rate to ICU and overall hospital stay, and the cost. We have a good response from the nursing staff. And they liked it. Since that time, our screening compliance has consistently exceeded 80%. Our benchmark is 80% for screening. Screening compliance is always more than 80. In fact, in some of the wards, it has been 95 and above for the last six months, indicating that it is becoming a culture. The nurses were aware of the sepsis, and they are doing it in a daily manner. They help us a lot in diagnosis and intervening for sepsis, and even the feedback from the nurses regarding the screening that the overall time they need is around 15 to 20 seconds to fill out the form. It became easier for them because it's parallel, and they can use it on the same computer and parallel to the Shifa system that we are using at the Royal Hospital. So, they find it convenient to pull out the same data from the Shifa system and put it on the screening tool. Also, this screening improved their communication with a doctor, how they communicate with them, and how they inform the Doctor if this patient is septic or not, so we actually had a good response from the nursing staff.

Manu Sundaram

does your tool complement the Phoenix score?

Omar Al Defaei

the Phoenix score is different from our screening tool because in the Phoenix score, we are waiting for other labs collected and the lab results to determine the sepsis and degree of sepsis, and after that, it will formulate the management. Our sepsis screening is quite different because the nurses can first do it. It can be done from the triage, without waiting for the labs, and other things also differ from the Phoenix; our sepsis screening has already been validated in places like the UK and Spain, where a similar screening was used with a good result. We are looking forward to using the Phoenix score and looking for ways to implement the Phoenix score in our screening tools. This is the main difference that we are finding from the Phoenix score. Our screening tools differ from the Phoenix tool in these two main points that I mentioned,

Manu Sundaram

My last question is: What advice would you give to other ICUs in the region looking to implement a similar tool?

Omar Al Defaei

If they want to decrease the admission rate to the ICUs, this tool might help them, or they can adopt similar tools where they can reduce the admission rate to the ICU. This might help them reduce the mortality rate due to sepsis. It's an area they can investigate and an area they can improve. We are happy if the other regional PICUs want to hear about our sepsis program. We are pleased to help them and excited to learn from them if they have any innovations regarding sepsis.

Manu Sundaram

Thank you, Dr. Omar. Data is often called the new oxygen in healthcare. Dr. AbdulRahman AIDaithan, you have been leading the development of a PICU registry in Kuwait, which is a significant step forward for the region. Can you walk us through how this registry came to life?

AbdulRahman AIDaithan

Thank you, Dr. Manu. The registry was initially started in mid-2022 when I started doing my fellowship. I worked in the pediatric critical care units for a couple of years before I went to my fellowship, and I was involved in multiple administrative projects. This question always comes to my mind when doing administrative projects. For example, if you're going to take care of the CLABSI or CAUTI, which project should you give more priority to? So, to decide on this, it has to be built on data. When I came to search, I couldn't find any regulated and well-formed data supporting the decision regarding which project should be prioritized. So, at this point, I started to look for registries worldwide, and unfortunately, some registries are lengthy, take a long time to fill, and have so many variables that they cannot fit in the unit. So, at this point, I decided that if I build my decision regarding which priority I should give, it should be based on data. From that point of view, the decision regarding whether we need to have a registry and whether we need to have data to drive the decision and build the registry. That was the point that broke down the decision regarding the need to start having a nationwide registry.

Manu Sundaram

Thank you very much. Please tell me more about how you created this registry.

AbdulRahman AIDaithan

So, when creating the registry, we initially used Google Spreadsheet, which has a plugin. A company called Appsheet created a plugin for Google Spreadsheet that reflects all the variables in an app. It's a non-coding platform, so you're going to transform your Google spreadsheet or Excel sheet into an app on the phone. And having the app on the phone is easy to utilize. You will share it with champions and leaders of the data in each unit. Each unit will have the champions entering the patient discharge variables. We could look at this data with time they became a champion and supervisor for anyone doing the discharge summary. They supervise and ensure that they enter the data with the discharge summary. They ensured that the data quality was consistent with the variable definitions we built. Each variable had its definition, and they knew exactly that. What does that mean? For example, if I'm going to, say, an intubated patient, is a Tracheostomy considered intubated? The variable has its definition through the registry, and he can easily capture that variable.

Manu Sundaram

Thank you. It's interesting that you've chosen an app-based or phone-based registry, which is different from the other registry. What type of data is collected, how frequently is it collected, and how time-consuming is it?

AbdulRahman AIDaithan

I ensured that patient data entry would not take more than five minutes. So, we extract the data every four months, and I do the analysis and extract all the data. Make sure that the quality of data is within the accepted range. If there is any significant error, for example, if suddenly someone entered the discharge date as the length of stay became too long, we go back to that champion and discuss with him that it is truly like this patient took two years. Suddenly, we found some error, and he tried to correct it or the patient was chronically in the ICU, so it took two years for him to get out. So it's regarding how fast they are entering.

I ensured that it did not exceed five minutes because otherwise, people would not be happy with entering the data, and it would be time-consuming, especially during the winter season when people wanted something fast and accessible, which was on their phones. It usually does not take more than five minutes. Two to three, maybe once or twice, patients stay on high frequency for a long duration required to enter many variables. The variables that really have a value for the head of the unit and the unit itself were chosen. For example, how much NIV consumables are required? So, we need the mask, equipment, and connections during the season. So, if you don't know how many patients you have on NIV during the season, you cannot request those items. So it gives you a background. It's like, how many patient patients do you expect to have during the season? So, you prepare your items ahead of time if you lack the nurse staff during the last season, for example, if your unit covers 400 patients. So, you need to calculate your workforce, including doctors and nurses. So, there is a lot of information that will be data-driven, and it's built so that it does not give you dirty data that is unnecessary and uninformative. I avoid it as much as I can so that no variables will not affect the unit.

Manu Sundaram

And when is the data entry done for the patient? Is it per patient during discharge or on a daily basis that's kept updated?

AbdulRahman AIDaithan

So, the data entry is usually on discharge because there are variables that you will never know unless the patient goes through the discharge. So, for example, regarding the outcome of the patient, you need to know if the patient is discharged to the HDU or, for example. Unfortunately, mortality can happen. So, to know that, you need to enter it when you are discharged. That was an agreement by the whole team that we needed to do it on discharge. So even if we collect the culture output, the Nasal Pharyngeal Aspirate (NPA), and the whole result of the variables is already there, you're going to enter it once the patient is discharged.

Manu Sundaram

Thank you. What's the preliminary insight from the registry, and how has it influenced critical care in Kuwait?

AbdulRahman AIDaithan

So, we have a task force built for pediatric critical care nationwide that involves all pediatric ICUs in Kuwait. We do develop our own guidelines and protocols internally. To decide which priority we should give to which protocol will be according to our number of patients. For example, let's decide regarding developing a protocol for ARDS. We need to know how many patients we have annually, for example, critical asthma. That helped a lot in deciding which protocols should be taken into consideration and giving priority compared to the others. Add to that, multiple outbreaks happened during the past two years, for example, the Pertussis outbreak mid-last season, which was also detected by the registry, and it gave us the guide that we need to look at what's going on, what's happening, why we have a high rate of pertussis. Then, we looked at the registry; we found a high surge and peaking of pertussis patients admitted to the PICU, which led to the research opportunity in the GCC. And you know that we are leading the research on pertussis. It can recognize outbreaks. It can help decide whether we need to prioritize these guidelines for this policy over others.

Manu Sundaram

Do you see any opportunities for regional collaboration across borders using this model?

AbdulRahman AIDaithan

I've already talked to a couple of pediatric intensive care units in the region, and they were more than welcoming of the idea that they join us. Eventually, we can do the benchmark not just internally but also externally.

Manu Sundaram

Thank you. Doctor Abdul Rahman, let's move on to non-invasive ventilation, which continues to evolve in paediatrics. The Iceman algorithm is a structured approach to safely initiating non-invasive ventilation, which Dr. Khaloud Said from Oman has adopted extensively. I'll let her introduce the Iceman framework, explain how it works, and assist clinicians in making NIV decisions in real-time. Kholoud Said: Thank you, Manu. This is a very good question. The Iceman is a structured approach that provides a comprehensive tool for assessing and managing pediatric patients needing non-invasive ventilation. This mnemonic stands for certain steps in the process of NIV initiation.

The I refers to **indication**. During this step, we review the indications for NIV initiation. The indication could include either type one or type two respiratory failure.

The C stands for **contraindications**, and during this step, we review the contraindications for non-invasive ventilation initiation. This is a crucial step to ensure that NIV is not provided for diseases with high failure rates, such as pediatric ARDS, hemodynamic instability, or encephalopathy. We must exclude patients with contraindications to non-invasive ventilation because delayed invasive ventilation increases mortality in the PICU.

Now, the letter E stands for **equipment**. During this step, we will decide which equipment we need. That would include the type of ventilator tubing and what interfaces should be used. The M stands for the **mode**. During this step, we will choose continuous positive airway pressure (CPAP) or bilevel support, depending on the indications for NIV in each case. The A stands for failure analysis; during this step, we troubleshoot the possible causes for non-response to non-invasive ventilation. Examples are hypoxia or hypercapnia.

The N stands for next steps, and this is the last step. During the last step, we decide whether we are dealing with a responder to non-invasive ventilation, where we continue monitoring, or whether we have

a failure, where we might need to change the settings of non-invasive ventilation or the mode or go to invasive ventilation.

Coming to the second part of your question, how does the ICEMAN approach assist clinicians in making real-time decisions? It is essential to understand that the IceMan approach provides a structured approach for assessing and managing patients needing NIV. Therefore, it can be protocolized for the indications of NIV. The second important point is that a structured approach like the ICEMAN approach will reduce the risks of inappropriate patient selections for acute NIV. So, by excluding patients with contraindications for non-invasive ventilation, we ensure that the initiation is done on the right population of patients. The third thing is that it provides a framework for analysis of failures to non-invasive ventilation, and hence, it assists in troubleshooting non-responders to non-invasive ventilation.

Therefore, it provides a comprehensive approach to initiating and monitoring non-invasive ventilation.

Manu Sundaram: That's very exciting. Has this approach reduced unnecessary intubations or delays in escalating care for patients with respiratory failure?

Kholoud Said: This is a great question, and the ICEMAN approach has helped us to standardize our training to non-invasive ventilation. Now, looking at the outcome of implementing non invasive ventilation in our unit, we have seen a reduction in the invasive ventilation with invasive ventilation requirements in 12.7% of our patient cohorts who were started on non invasive ventilation for different diseases, including bronchiolitis, pneumonia, asthma and acute chest syndrome. Based on a retrospective analysis of 299 patients started on non-invasive ventilation for acute respiratory distress, that was. The other advantages are that we found that initiating non-invasive ventilation in our unit has reduced the escalation to PICU and that in 78% of patients who were treated with non-invasive ventilation in our high dependency unit(step-down unit), 78% of them did not require to go to the PICU, among patients with severe bronchiolitis who were treated with non-invasive ventilation in high dependency Unit, we also found that 87.5% of those patients were successfully treated in high dependency unit, and they did not require escalation of care to PICU.

That played a significant role in reducing escalation to the PICU and, therefore, allowed the PICU to look after patients who fail NIV or those with higher severity of disease, which was very helpful for us from a resource management perspective.

Manu Sundaram: This significantly frees up ICU bed space. Are there any efforts to integrate this into electronic records or clinical pathways in your country?

Kholoud Said: The ICEMAN approach right now is part of our educational packages for our nursing team and pediatric trainees. Currently, we are having regular training on non-invasive ventilation, including the use of the ICEMAN approach, and we target the training around the bronchiolitis season to catch up with the new staff. In addition to that, NIV training and ICEMAN approach training is part of the curriculum for pediatric residents. So, in terms of including that in the training, it is already there. We haven't changed it yet into an electronic checklist.

Manu Sundaram: Let's ask Doctor Abdur Raman Dithan, our registry expert, how this can be integrated into registries and whether he has integrated this data into his registry in Kuwait.

AbdulRahman AIDaithan

Thank you, Dr. Manu. Currently, we are tracking the Non-invasive use, and we plan to add the days on non-invasive, so we track the duration it takes the patient to be on non-invasive, as mentioned by Dr.Kholoud. The IceMan framework is fantastic in helping the patient be non-invasive and educating the staff. We are trying to add it in a way that is easily going to be part of a guideline protocol for the patient

to initiate on Non-invasive, so the People can easily refer to references electronically on the phone and see, for example, as a PDF, what they have to go through on initiating NIV.

Manu Sundaram

My final question for Dr.Saluda and Dr.Abdur Rahman is whether we should expand this to other centers or adapt it for post-acute care settings.

Kholoud Said

By targeting the training for the pediatric trainees, we are expanding it to the rest of the regions in the country because the pediatric trainees come from different regions. They get their training in the capital city, and after that, they go back to their regions. By catching up with the trainees, we hope the NIV training will spread to the rest of the country. This is one of the steps in which we catch up with as many people as possible. In addition, there are regular NIV workshops that we try to include in local conferences to educate as much as possible.

Manu Sundaram

Thank you very much. Each of these projects reflects leadership innovation and a deep understanding of the local context, but innovation comes with challenges. What barriers have you faced, whether technical, cultural, or resource-based? I'll leave this question open to our three speakers.

Kholoud Said

One of the most typical barriers was “staff buy-in” and engagement with a new idea, as it takes time to breed a new culture or change. That was the most important thing that I have encountered. The second point was financial resources. For example, implement NIV, which requires ventilator consumables such as tubing and interfaces. And as we expanded the service of non-invasive ventilation, the costs of non-invasive ventilation were consumable. It was important at that stage to show that the advantages of implementing NIV outweigh the costs, like comparing the ICU stay for responders of non-invasive ventilation (which is shorter) versus the stay for those who require invasive ventilation and reflecting on the fact that use of non-invasive ventilation in high dependency unit reduced escalation to the PICU. The two most important barriers were engaging the staff in the new idea and allocating resources for the quality project.

Omar Al Defaei

Yeah, from my side, I have two significant barriers. Barrier number one is integrating the existing tool into the hospital system instead of making it parallel with it, like using the internal server to use it within the system itself. If we have integrated it into the system and allowed it to do so by itself, then we are offering artificial intelligence. And they are also actually because they work in another institute. We're putting the patient's background and vital signs. Pop-up screens are coming by spontaneously, saying that the patient is septic and that we must pay attention to that. This is my significant barrier to integrating the screening tool into the hospital system. The other barriers are that because we are teaching hospital, we have a lot of turnover of residents and we have to keep them all aware. The screening science is quite challenging, and now we have started integrating serial lectures about sepsis screening within the teaching Institute. However, the other challenge will be integrating the same teaching and serial lectures within the hospital for the coming residents and interns. Those are two barriers I'm facing in implementing the innovation.

AbdulRahman AIDaithan

As for the registry, one of the significant barriers is that we lost one of the champions. He moved out of the hospital to another country. Which required us to recruit a new champion to cover that hospital? But we know the turnover of doctors is there. Luckily, the learning curve for the registry is very minimal. It is a short period, so it didn't require us a lengthy learning curve, and the new champion took over. But other than that, it's easy for the data analysis at the end of the year to do the data analysis for the whole registry. It's challenging. Analyzing 2000 to 2500 patients takes much time to extract an informative report. But with time, things mentioned before, such as the evolving AI with involvement using ChatGPT, sometimes I utilize it to help with the analysis. Eventually, things will get shorter. It takes two weeks to do that data analysis. It takes around one week, sometimes even five days, to get the final report.

Manu Sundaram

Thank you. Let's look to the future. In one sentence, what is the next big thing that you hope to see in Middle Eastern ICUs?

Omar Al Defaei

I will go for this. My big the Actually, I'm seeing shortly that now, with the era of AI, I'd like to see more AI integration into the ICU and also to use AI in screening for services. This are the major things I dream that might be implemented in the ICU soon

AbdulRahman AIDaithan

Regarding the registry, my dream for the future is to have capable machine learning with an algorithm that can have the influx of data from the patient monitor. We underrate the monitor data; the variables are so solid that if we build a machine learning algorithm, it can intake that flux of data and extract how predictive it is. That's going to be the future. It's going to tell you that this patient is most likely going to deteriorate within the coming 24 hours or that this patient has a high risk of success. You need to be cautious. And it is going to help with everything. It is not going to take off the Doctor. He still needs the Doctor and the nurse, but it will support patient care.

Manu Sundaram

This brings us to the end of this powerful conversation. A big thank you to Dr.Khaloud Said, Dr.Omar Al DAFI, and Dr.Abdul Rahman AIDaithan for sharing your experience, passion, and wisdom. Your work is a beacon for what's possible when technology meets its purpose in pediatric care. Thank you for your patient listening.

AbdulRahman AIDaithan

Thank you very much for this opportunity.

Omar Al Defaei

Thank you.

Kholoud Said

Thank you. It was a pleasure to be here today.