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BIOMED ENGINEERING TIMES

Strengthening Healthcare Delivery Services Through Appropriate Technology

Association of Medical Engineering of Kenya

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Editor's **Note**

Biomedical Engineering profession together with other healthcare professionals has played a key role in saving and sustaining the lives of many Patients in the world. By keeping all Medical devices in optimal working conditions has earned the profession glory in the entire globe.

AMEK has not been left out in this success story as for the past two years voices have been raised to strengthen the oxygen supply in hospitals and the Government through the Ministry of Health headed to this call by AMEK. In addition our Members have been playing a key role in the identifying the right equipment through technical specifications in our various hospitals. We urge you to pursue this line with integrity for the benefit of all of us.

This Publication comes to you late since for the past two years there were virtually no activities due to the pandemic and therefore this justifies the reason. However, this has also taught us many ways of survival and helped us to scale up our thinking in a critical dimension. Keep observing all the protocols as enforced by the Ministry of Health and WHO and be safe always.

Most exciting is the rebranding of the Magazine from Biomed Essence to Biomed Engineering Times, most of will agree with me that this long overdue and forthwith we adopt the latter.

This Biomed Engineering Times (BET) therefore has a lot information for the benefit of everyone, we have tried to balance so that all information is shared well and our Members get to receive the right information by just opening any page of the BET.

We have received adverts from various Partners who have displayed their services and Products in this Edition of BIOMED Engineering Times. These Include; Megascope Healthcare Limited, Amotech Africa, GE, Neusoft Medical Systems, Philips Medical Systems, Neopenda, Biomedical & Engineering Solutions, CHAK Medical equipment hypochlorite project, Gradian Health Systems, Arjo Africa Exports, Ecomed, Mindray Kenya, Hargain Healthcare Limited, Surgilabs Masimo Technology, Easy Drain, VDMA and O2 International among others. The Editorial team thanks all the Partners for trusting us, we have therefore put all the adverts the best we could.

In addition there are informative articles in areas of the profession and hope they will add value to you all; Therefore enjoy by reading through the statements from the National Chairman, Secretary general and the conference Organizing Chairman.

These statements carry lot of information for the consumption of all of us. Educative articles included this edition include; Medical engineering Roles in KEMRI, Strengthening Technology in Healthcare during COVID-19 Pandemic, The Role of Biomedical Engineers in Hospital Projects, Monitoring and Evaluation as a tool for quality assurance and control in our healthcare institutions.

AMEK news Corner has also been included which include the reasons why one should join AMEK a perennial questions in all AMEK Platforms and Training Partnerships during the Pandemic Period.

Lastly the Editorial Team sampled a few photos for you to see the past AMEK activities and Events, Including the Hidden Heroes of Covid -19, where our own Hon. Secretary General has been Mentioned.

We invite you to participate in our next edition and assure you all your concerns will be addressed. Please feel to write to us through amekenya@yahoo.com

May you stay in Biomed Engineering Times by being Heroes in our own way.

God bless you

Hon. Annarose Gitau

Editor

Biomed Engineering Times is published for the Association of Medical Engineering of Kenya (AMEK) by:

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How to Register **with AMEK**

a). Why Join AMEK?

The need to join as a profession goes without much hesitation as one has to be where other fellow colleagues are. For this reason AMEK was formed to bridge the gap for Biomedical engineering profession. As a legal entity it is therefore prudent for Biomedical Engineering professionals to be part of AMEK and change the narrative of what AMEK will do for me to a vision of with question of what can I do as an member do to AMEK?

b). Benefits of Joining AMEK

There benefits are enormous and therefore not limited to Information Sharing, Networking, having synergy together, Capacity Building through (seminars, conferences, CME's, Trainings, etc), Job market easy penetration for Partners, as a Reference Point in the Profession, Recognition globally by International Bodies and Organizations, Professional protection and growth, Being home by being where others are, Integrity, Passion, Social Protection, Welfare support, Employment opportunities, Business and Partnership opportunities among others.

c). Requirements to join AMEK

- Qualification in Biomedical Engineering Training
- Down load the application form from AMEK website: amek.or.ke
- Scan and send to amekenya@yahoo.com
- Attach the Following Documents:
- Highest attained Certified Certificate in Medical/ Biomedical Engineering Training
- Identification card
- Two (2) Coloured passports.
- Pay registration fee of Kshs.600.00
- Pay subscription fees of Kshs. 6,000.00 (annually) or Kshs. 500.00 per Month
- NB. For students Ksh. 3000 (annually)
- For Corporate membership is Kshs. 10,000.00 annually and Must provide their profile, Business Permit and physical Location and contacts

d). What to Receive After Registering

Membership Certificate, Membership card, Be issued with AMEK code of conduct, Be issued with AMEK constitution, Join WhatsApp groups, Details entered in AMEK data Base, Start Participating in AMEK activities, Attend all AMEK events as a member, Can join AMEK Council among others.

PAYMENT DETAILS

BANK DETAILS		PAY BILL DETAILS
BANK NAME:	Standard Chartered Bank	PAY Bill No. 823910
Branch:	Harambee Avenue Nairobi	Account: Your ID. No.
BRANCH CODE:	02019	
SWIFT CODE:	SCBLKENX	
ACCOUNT NO:	01520-793867-00	
CURRENCY:	Kshs.	

Email: amekenya@yahoo.com | **Website:** amek.or.ke
Physical Office Location | Nairobi: Afya House, Annex Building, Medical Technologies Unit (METU)
Tel: 020 7867375

Hon. Amos Mamati

Treasurer
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Chairman's Statement
End of 2021

Dear all Members, Stakeholders/Partners and associates, it gives please to communicate to you all through this AMEK magazine of 2021. Indeed, we Must thank God for being here at this time of the Year after going through a very difficult period of the COVID- 19 Pandemic that bought the whole world to a halt.

We cannot assume that all is well even after moving out of the lock downs and out of our Social life among other related matters. Life will never be the same again because we all learned new ways and tricks of survival during the Period.

As your Chairman, I applaud you for the Enormous effort and dedication that you offered during the pandemic,

CONGRATULATIONS TO YOU

Although the Ministry of Health did not recognize Biomedical Engineers as front line workers our efforts and contributions towards its management said it all and we can comfortably attest that we indeed played a noble role to justify our position.

It was the first time that we raised our voice regarding the need for oxygen in our hospitals and heard within the shortest time possible. The Ministry of Health heard the noise and acted towards its call. This has seen several oxygen Tanks installed in various hospitals making oxygen very available to many with more to follow soon.

I take this opportunity to thank the Ministry of Health for heading to this call and eventually saving more lives besides comparting COVID- 19.

The Medical Engineering Bill which is still stuck in parliament has really delayed most our activities, the reason being that Bill is to be the regulatory body and offer road map to the regulation of the profession among others. We pray that parliament acts expeditiously to the third reading and enactment and put this matter to rest.

This being my last statement as your Chairman, I feel to really accomplished my task since I had promised the Bill to be in place before I leave office. I now leave it to incoming office and wish them all the best in delivering the bill to members. I encourage training institutions to also offer training that are geared in problem solving with innovations as an alternative measure to address the needs. The Training institutions have commercialized the profession and thus looking at the Mass training as opposed to quality Training. Train small and quality but NOT a mass for the market. The end results is that there will be too many graduates with littles skills and thus high unemployment rate.

I also invite the Ministry of Health and Partners to collaborate with AMEK and carry our Skills upgrading courses on selected topics to enhance capacity building in the profession.

The Medical devices management Policy has not yet been Launched, I request the Ministry of Health to fast tract its Launch so that the issues of equipment management can be addressed amicably at all levels.

As we come to the end of 2021, I wish to that all member and our Partners to continue offering the same services to our citizens by ensuring that the Medical equipment life cycle is well managed.

I wish you all a merry Christmas and a happy prosperous year 2022.

Hon. Eng. Edward Matekwa

Chairman Association of Medical Engineering of Kenya.

Statement from the **Conference Organizing Chairman**

Its gives me pleasure to see 2021 AMEK scientific conference and Exhibition take place after a long global break perpetuated by the COVID-19 Pandemic. This saw the year 2020 was a full of lock-downs with virtually no major activity done. It was a suffering for all us which has left us with a different thinking in handling safety issues.

This Year the AMEK council had an opportunity to visit some of our Partners to discuss on how to engage more in the Conference Exhibitions and future Magazine editions and seeing how they place their Adverts to support the Association. This is because our Magazine offers a platform to market them in Kenya, East Africa and beyond. It is for this reason that we adopted the strategy to walk to them for these discussions.

Some of the Partners we visited are: Gradian health systems, Mediquip, Lued Africa Limited, Fortec Medix supplies, Pulse Medics, Lab Vision, Baylem, Debra, Megascope Healthcare, Angelica Medical supplies, Easy Drain, Nihon Kodhen, Surgilabs, O2 International, Amotech, Medware, Total hospital solutions, Farmed, Hargain healthcare, Mindray, Biomedical and Engineering Solutions, Event bank-America, Falguni, Equalize health, Crown Health Care, Philips Medical Systems, Arjo Africa Exports and Hendrick Finnish Embassy. In addition we had the opportunity to have virtual engagement with Verband Deutscher Maschinen- und Anlagenbau (VDMA) a German Centre of excellence involved in skill upgrading courses. Other partners are Kijenzi, MC Finery, Phoenix, Acon and NEST 360.

On behalf of AMEK council I wish to thank all partners for their warm reception and cordial relationship that we have built together our engagement should see us address issues on Healthcare Technology with synergy.

I also urge the Partners to consider absorbing more of our Members in their institutions to reduce on the number of unemployed Biomeds in Kenya. I wish you a splendid conference and entertaining magazine till the next edition, feel free to give us your suggestions and critics for us to improve further to amekenya@yahoo.com

As you read the magazine I invite you to know that Benjamin Franklin used to say: “The bitterness of poor quality remains long after the sweetness of low price is forgotten” may we emulate Franklin as we plan our activities.

Always be Safe by, washing hands, sanitizing, keeping social distance as a norm and to remember to disinfect all equipment and Tools before handling them and Donning appropriately at all times as a rule of the thumb. Be guided by the fact that your safety precedes all others during the call of duty

Hon. Symon Mbakah

Conference Chairman, 2021

Hon Secretary **General's Report**

I salute you all members, stakeholders/ Partners and all Associates. Everyone plays different roles in the management of the Association and therefore allow me to thank you all for the far we have reached together by the Grace of God.

Allow me to start by mentioning that due to COVID-19 pandemic which threw all of to the mud without knowing how to get out,this is the only edition produced for both 2020 and 2021, therefore the content herein is huge and informative, ,lets get impacted and impact others as well through the information in here.

As your Secretary general, together with the council Members we have knocked doors to many offices to raise our voice in addressing issues pertaining to Biomedical Engineering. These includes but not limited to the following:- Oxygen crisis issue in the country where we have all seen the results as Most of the hospitals now have oxygen tanks and plants installed after we raised the need through tough talks. We commend the Ministry of Health for heading to this call and therefore urge all the Biomeds who are beneficiary to ensure that all the oxygen Plants are in good working order by 100% implementation of Planned preventive maintenance (PPM), Prompt Breakdown Maintenance (BDM), Routine inspection and checks for oxygen purity and pressure compliance purposes This is the only way we can give back to our institutions and to MOH.

I also urge all the Companies that have been contracted to supply these equipment/plants to give appropriate support in ensuring 100% uptime as the plants are categorized under critical equipment in the hospital, this can be achieved by availing the spare parts promptly when needed, stock regularly used parts and service kits, Share the right information with team on the ground by training appropriately and the response time to breakdown Maintenance should not be anything more than 2 hours. With these many more stringent measures, the life cycle of these oxyplants will definitely be elongated. As to the Biomeds on the ground take full responsibility by monitoring all the above, establish good rapport with both vendors and hospital management in order to gain support as you really need them, lets reach out to AMEK office on even more better practices on managing all these critical equipment within our facilities. Team we have to support the government.

During the pandemic AMEK organized with various Partners to conduct virtual trainings that were well attended and hopefully met the expectations of our Members. We conducted over 20 trainings some of which were certified, I take this opportunity to thank our Partners, Equalize Health, NEST 360 and Kaizmed for the wonderful Virtual trainings they offered to members. I urge all the AMEK members to keep attending these trainings, information is power and we need it to support our various institutions, also to remain relevant to our jobs and this can only be achieved through continuous learning, in future ensure all the Biomeds around you participate, keep a log of how many such relevant trainings you attend in a year, you will see the impact you will create in the society.

In the spirit of togetherness with our unemployed colleagues, we also reached out to various employers including MOH and various County Governments and private sectors seeking more opportunities for our members and few were beneficiaries to these efforts. This will be continuous process until we all get equal opportunities in both private and public sectors.

The country and even the world at large is still struggling to understand what exactly biomedical Engineering is and what does these biomedical Engineers do? With this in mind we have had four press conferences since last year to articulate various issues and to bring to the attention of the country how much potential we have in the healthcare facilities. This lead to AMEK being recognized by national standard newspaper as one of the institution having hidden heroes and soon will not be called 'hidden" Heroes but "seen" heroes in healthcare Facilities. A number of articles and AMEK events were also captured in our national newspapers, to create awareness of our existence.

In order to support gender diversity, this year we celebrated our 1st ever World Women in Biomedical Engineering Day on 23rd June, 2021 at Crowne Plaza hotel, Nairobi, an event which caught the national attention as it was officiated by our very own Director General of Health Dr. Patrick Amoth, and was embraced by many other senior members of the nation namely Jane Wanyama, CEO Aga Khan Kisumu, Marion Njeri, MD BOC, Jenniffer Kinyoe, CEO GE Healthcare and Dr. Alice Otwala of the National Police service. We plan to have more of these as gender diversity is one of our core mandate as leaders. Thank you all for embracing this event.

Again in order to keep abreast with the international Bodies events, AMEK will be celebrating the world Biomedical Engineering day on 8th December, 2021, this marks the 1st ever celebrated in this country, this event will be officiated by our very own CS Health Hon. Mutahi Kagwe, and will be attended by many other dignitaries across the country including Kakamega County government top leadership, all are invited to participate in this event.

To our training institutions, quite a number of graduates are joining the field, we need to ensure only qualified candidates joins the profession as this is health profession, lives of people depends on our articulate support and we cannot water it down the drain by enrolling unqualified candidates. Mathematics, Physics, Biology and Chemistry remains to be our core areas of focus in order of priority, Also reach out to AMEK office for various standards on how to make our graduates to be fully baked. AMEK will embark in career support in the next tenure through different collaborations with training institutions.

This year AMEK Council approached our Partners differently by some of the Council members visiting the Partners at their premises to engage ways of further partnering as well as participating in this year's conference. The idea was well received and going forward the Council will adopt this strategy in order for all of us to grow together.

We have just re-branded our newsletter from Biomed Essence to Biomed Engineering Times. The times are changing we need to grab Biomed Times.

Finally the issue of Profession regulation is still a thorn in the flesh, without mentioning much here a lot is being done behind the scenes and within this next tenure will have a fully authorized regulatory body with the support of MOH. The future is so bright members.

Lets keep safe, sanitize and disinfect equipment before any service as this is the new normal for all Biomeds.

May God Bless you

Eng. Millicent Alooh

Hon. Secretary General, Association of Medical Engineering of Kenya

Biomedical **Engineering Roles (KEMRI)**

WHO WE ARE:

The Kenya Medical Research Institute (KEMRI) is a state corporation established through the Science and Technology (Amendment) Act of 1979, which has since been amended to Science, Technology and Innovation Act 2013 as the national body responsible for carrying out health research in Kenya.

KEMRI has grown from its humble beginning over 40 years ago to become a regional leader in human health research.

The Institute currently ranks as one of the leading Centers of excellence in health research both in Africa as well as globally.

OUR MANDATE

- to carry out research in human health
- to cooperate with other research organizations and institutions of higher learning on matters of relevant research and training

KEMRI is the Medical Research arm of the Government and provides advice to the Ministry on various aspects of healthcare and delivery. National diseases surveillance and rapid response capacity for major disease outbreaks (Covid-19, Cholera, Chikungunya Virus, H1N1 Flu, Yellow Fever, Rift Valley Fever, Ebola, Aflatoxicosis etc).

In line with the constitutional requirements, KEMRI has developed a comprehensive framework under which the Institute has devolved its research activities and services, through seven regional clusters that serves the forty seven counties under the strategic pillar of health research in the context of devolution.

Technical and research support for the Emergency Care of Critically Ill Children (ETAT) guidelines. KEMRI provided Technical Facilitation in development of National Guidelines for Prevention of Cervix, Breast and Prostate cancers. Developed a curriculum and guidelines on biosafety and biosecurity for Health Care Workers in collaboration with MOH. Rationalization and regulation of traditional medicine. Human resource capacity development for research though attachments and in the KEMRI-JKUAT.

WHAT DRIVES US

- Our vision is to be a leading center of excellence in research for human health
- Our mission is to improve human health and quality of life through research, capacity building, innovation and service delivery
- The motto of the Institute is “In Search of Better Health”

OUR CORE VALUE

- Uphold zero tolerance to corruption.
- Uphold the philosophy of respect and fairness to all.
- Commitment to excellence and highest standards of professionalism.
- Uphold purity/sanctity of life.
- Commitment to promoting and supporting creativity and innovation.

1.0.0. BIOMEDICAL ENGINEERING ROLE IN KEMRI

All devices that are being used in biotechnology research work have the same life cycle as those in any health care set up, so researchers can learn from the biomedical engineers on how to improve the use of their instruments.

Our roles as biomedical engineers in KEMRI are:

1. Establish policies and guidelines to ensure that the technology used in research protocols is reliable and safe throughout development.
2. Implementation and evaluations of technology management programs ensuring quality processes such as calibration, service & maintenance as required by **ISO 9001:2015 STANDARDS.**
3. Covering demand in all engineering aspects as maybe required in the institute
4. Complying with national and international rules for biomedical devices. Additionally, we have developed and implemented tools to define the needs for new technologies that will be incorporated into the Institute as well as establish technical guidelines for the acquisition through technology assessments and a cost/benefit analysis.

1.0.1. MAJOR RESEARCH EQUIPMENT AT KEMRI

Sample Preparation & Liquid Chromatography (SPLC), Genetic Analysis Instruments- fluorescence-based automated sequencing technology as well as real-time PCR systems. Research laboratory freezers and refrigerators, research laboratory incubators and drying ovens, clinical biochemistry and hematology analyzers.

Biological safety cabinets and clean benches, pipettes, readers and washers, heating, Ventilation & Air Conditioning (HVAC) Systems, Analytical balances, Centrifuges, votex mixers, rollers and stirrers, Microscopes, Water baths, Water distillers, Autoclaves, Homogenizers and sonicators, Spectrophotometers and Water purifiers

Eng. Yonni Owinyo

Kenya Medical Research Institute (KEMRI)

AMEK
News Desk

	UPCOMING EVENTS	DATES
1	Trainings with various Partners	Dates to be communicated and Venue
2	IFBME: World Congress on Medical Physics and Biomedical Engineering, Sands Expo and Convention Centre, Singapore	12 – 17 June 2022
3	International Women in Engineering Day	23rd June 2022
4	Biomedical Excellence Day	August 2022
5	Biomedical Engineering World Forum in Berlin, Germany.	August 18-20, 2022
6	IFHE 2022 CANADA, 27th Congress of International Federation of Hospital Engineering will take place in Toronto	September 17-21, 2022
7	World Biomedical Engineering day	5th December, 2022
8	AMEK Conference & Exhibition 2022	6th to 8th December, 2022
9	Federation of East Africa Hospitals Engineers Associations conference	Dates to be communicated
10	Africa Hospital Expansion Summit 2022	Date and venue to be communicated

Many more events will be shared through AMEK website when received... amek.or.ke

For more information please write to us through email, amekenya@yahoo.com

Hon. Symon Mbakah

AMEK Conference Chairman

How can an online application help keep close tabs on diagnostic device maintenance and utilization, evaluate performance, and plan for the future?

Challenge

Keeping track of performance on 14 MR imaging systems in 11 locations used to be a challenging task for Jennifer Brown, RT (R) (MR), coordinator of MRI services with Inland Imaging in Spokane, WA, USA. At these locations, Inland Imaging performs approximately 3,000 MR exams per month. Jennifer Brown directly supervises six team leaders and oversees a staff of 45 FTE consisting of registered technologists and assistants. The imaging centers generally operate from 6 a.m. to 9:00 p.m. Monday through Friday and from 7 a.m. to 5 p.m. on weekends.

To sustain uptime during those long hours in the face of heavy patient volume, Inland Imaging relies on its service agreement with GE.
"In our opinion, the service is absolutely impeccable," says Jennifer Brown. *"We very rarely have downtime here at Inland Imaging. An outstanding feature of GE service is their engineers' availability, and their flexibility in being able to service our equipment. We only have a window of six to eight hours where we're closed on a typical weekday. If we are experiencing issues with our equipment, they try to resolve them during those times when we are not actually caring for patients."*

Solution and Outcomes

In mid-2010, Inland Imaging began using the iCenter* – a web-based application from GE Healthcare to track planned maintenance and utilization on its MR, CT, and other diagnostic imaging devices.

gehealthcare.com

Inland Imaging

Inland Imaging operates eight all-modality outpatient imaging centers in and around Spokane, Wash., while also managing MRI services at two local hospitals. The practice includes more than 65 radiologists, and nearly 500 staff members. The imaging centers offer patients a friendly, comfortable, clean and safe environment. Inland Imaging uses groundbreaking technology and regularly reviews the standards of each piece of equipment. Upgrades and remodels are in constant cycle to keep pace with the changing needs of patients and the medical community. Each imaging center has the capability to send information and medical images electronically, and referring physicians have secure online access to patient results.

Now, with a few computer keystrokes, Jennifer Brown can generate reports that tell her:

- The status of planned maintenance and the service and maintenance history for any system.
- How effectively each system in each imaging center location is being utilized.
- How Inland Imaging compares with other outpatient imaging providers in MR scanner utilization.

The data helps Jennifer Brown and Inland Imaging management improve operating efficiency, reduce costs, and make sound decisions when contemplating equipment moves and upgrades. Access to the iCenter application comes as part of a service agreement with GE Healthcare covering all of Inland's imaging systems, manufactured by GE.

Jennifer Brown finds that iCenter greatly simplifies the oversight of MR services. Besides her, the primary iCenter users at Inland Imaging are the CT and ultrasound managers. *"We often present information from the tool to our administrative staff to give them a snapshot of what's going on with the equipment from a service and asset utilization perspective."* says Jennifer Brown.

The Inland Imaging team found the system easy to use and understand. Jennifer Brown typically reviews iCenter reports weekly and finds that she can generate reports in minutes. Before iCenter, if she wanted similar reports, she had to work with the organization's IT department.

"But now we can create the reports quickly without diverting IT from its main priorities. It saves the imaging centers money and is simply more efficient." says Jennifer Brown.

Track metrics and deliver data and analytics on status, maintenance history, utilization and performance against benchmarks.

A variety of reports help Jennifer Brown oversee MR services effectively. *"One thing we have found very valuable is the ability to keep apprised of when planned maintenance has been performed without having to call GE,"* she says. *"In addition, if we are having issues with a piece of equipment, the system can tell us in real time how long that device has been down and what GE has been doing to resolve the issues."*

A benchmarking feature in the iCenter application allows Inland Imaging to measure its device utilization performance against other imaging centers. *"Based on the benchmarks, we can tell whether we are doing a good job of using our equipment to the fullest,"* says Jennifer Brown. *"The iCenter data confirms our belief that we are very efficient in our device utilization."*

Facilitate your decisions about relocating, upgrading and staffing by monitoring patient and exam volume trends.

"Another feature we find very helpful is the reporting on device utilization. iCenter gives me an accurate picture of how many exams are performed per day on each particular scanner." That information can help guide operational and staffing decisions. It came into play when Inland Imaging opened a new center in the Liberty Lake region west of Spokane, just five miles from the nearest Inland location at Spokane Valley.

"We wanted to know the impact the imaging volume in Liberty Lake was having on the Spokane Valley center," says Jennifer Brown. *"We were able to determine from the iCenter utilization data that we could cut back our hours of operation at the Spokane Valley center due to opening Liberty Lake. We now schedule Spokane Valley from 6 a.m. to 8:00 p.m. each day, instead of 6 a.m. to 9 p.m. It wasn't a guess – the iCenter application allowed us to make that decision on the basis of hard and fast data."* This real savings of time each day results in slightly less than a 12 percent savings in labor cost each week[1].

iCenter

Make better decisions with greater insight.

iCenter is a secure cloud-based asset maintenance and management software application which provides data and analytics on asset status, maintenance history, utilization, and planning.

GE imagination at work

Data subject to change.
GE and GE Monogram are trademarks of General Electric Company.
* Trademarks of General Electric Company.
[1] Data coming from internal estimations performed by Inland Imaging.

Managed Technology Services aims to deliver sustainable, predictable and cost-effective performance

A collaborative approach for today's challenges and future needs

For every healthcare institution, technology is a significant investment and an essential component in quality healthcare delivery. It has become a key differentiating factor in improving patient care, and establishing a competitive advantage. Yet successful management of a broad installed base of hardware and software is challenging. Without a thoughtful proactive plan, a break/fix/replace routine becomes unavoidable, costly and overwhelming.

Ongoing concerns arise around product safety (for patients and users), efficiency, downtime, spare parts, financial feasibility, operational stability, cyber security, compliance, and more. This unpredictability, coupled with budgetary constraints and rapid technological innovation, leads healthcare providers to seek management partnerships in an effort to gain control over processes that are getting more complex.

How does this **service partnership** work?

At the core of a Managed Technology Services partnership is a set of long term solutions to assist healthcare providers with technology lifecycle management. The technology partner works closely to align with the provider's strategic targets, guided by key performance indicators (KPIs) and outcome objectives. The intent is to engage in a responsive approach to technology planning, ensuring continued delivery of high quality patient care with predictable and protected technology investment. A Managed Technology Services partnership should include procurement, installation, commissioning, training,maintenance, upgrading, and replacement of all healthcare equipment. It should be broadly suitable for radiology, cardiology, oncology, operating theatres, ICU and emergency care departments.

Please get in touch with us to learn more: customercare.ea@philips.com

Neusoft Medical **Systems Co., Ltd**

Neusoft Medical Systems Co., Ltd. (Neusoft Medical) is a leading global clinical diagnosis and treatment solution provider.

Neusoft Medical was established in 1998, headquartered in China, with subsidiaries in the United States, United Arab Emirates, Peru, Russia, Brazil, Kenya, Germany, Korea, Thailand and a representative office in Vietnam.

We constantly innovate our portfolio of medical imaging diagnosis and clinical solutions in CT, MRI, DSA, XR, PET/CT, RT, US and IVD. Neusoft Medical also is developing MDaaS (Medical Devices & Data as a Service), a strategic product line built using the Internet, big data, artificial intelligence, combined with other technologies to improve medical institutions' ability to diagnose and treat patients, driving productivity and efficiency for operational excellence.

Innovation has always been the driving force of Neusoft Medical. Our global R&D centers are located in Houston, Seoul, Beijing, Shanghai, Shenyang, Guangzhou and Nanjing. Neusoft Medical works hand in hand with medical, academic and research communities, dedicated to advance medical imaging technology, creating industry-leading solutions that transform the delivery of healthcare.

With 39,000 installations in more than 110 countries, one our biggest projects was implemented and delivered in 2018 in Kenya to supply 37 CT diagnostic centers to 37 different county and referral hospitals in Kenya. Neusoft Medical offers advanced medical imaging solutions and high-quality care to patients and healthcare providers around the world.

Neusoft Medical is dedicated to becoming an excellent value innovator of global healthcare services. Through innovation and excellent operations, Neusoft Medical Systems is advancing healthcare products across a wide range of medical solutions and services to enhance global healthcare to all.

neoGuard™

A wearable vital signs monitoring solution by neopenda

Our Solution

neoGuard™ is a simple, durable, easy-to-clean system designed for hospitals in low-resource settings to maximize operational efficiency and improve response time to critically-ill patients in distress.
It includes:

- 4-in-1 biometric data measurement, for up to 15 patients at once per tablet
- Rechargeable, long-lasting battery for 24/7 monitoring
- Biocompatible soft-touch silicone bands
- Wireless data transmission to a centralized dashboard
- Real-time visual and auditory alerts
- Historical trend displays
- Suitable for neonates, pediatrics, and adults

Monitoring Capability

Pulse Rate	Range:	45 - 205 bpm
	Accuracy:	±3 bpm
Respiratory Rate	Range:	5 - 30 brpm
	Accuracy:	±5 brpm
Temperature	Range:	30 - 40 °C
	Accuracy:	±0.3 °C
SpO_2	Range:	70 - 100%
	Accuracy:	±4%

Safety and Regulatory Information

- Neopenda is a ISO13485 certified medical device company.
- neoGuard is a Class IIb medical device with CE Mark regulatory approval.
- Additional safety data available upon request.

CE 2797

Learn More:
www.neopenda.com
info@neopenda.com

Customer Care:
service@neopenda.com

Purchasing:
Mediquip Global
Lower Hill Rd, Nairobi, Kenya
mediquipglobal.org
info@mediquipglobal.org
+254 706 287197

1-year warranty with all new purchases

megascope
HEALTH CARE
Your Medical supplies Partner

Megascope Healthcare (K) Ltd is a preferred supplier and distributor of medical equipment and hospital disposable since its inception in 2002 with its head offices in Nairobi Kenya.

Vision

To be recognized as a reliable supplier of healthcare solutions within Great lake regions of Africa.

Mission

We Aspire to meet the needs of our customers by efficiently and effectively providing healthcare solutions: Construction, Equipping, Installation and Training.

Turn-Key Healthcare Solutions

20 Years forte of perennial after sale support

Our Perspective

-Diverse product offering
-Personalized customer service
-Reliable Technical Support
-Application training centre & Onsite training
-Excellent after sale service

Lavington Green, Owashika Road
Off- Isaac Gathanju Road
Property 229, Nairobi

P.O Box 73161-00200
Email: info@megascopekenya.com
Website: www.megascopekenya.com
Tel: +254 722 999 097

Strengthening Technology in **Healthcare During COVID-19**

FACILITIES DEPARTMENTS

- Biomedical Engineers
- Support Engineers
- Pharmacy Dept
- Pathology
- Radiology Dept
- Physiotherapy Dpt
- Procurement Dpt
- Housekeeping
- Security/Transport

PLANT ROOMS

- Medical Air Plants Vacuum plants Oxygen Plants and Manifolds Medical gases and pipe networking Incinerator.
- Autoclave, sterilizers and dryers,
- Dialysis' Machine
- Water Purification System
- Operation tables Operation Lights Stretcher and trolleys
- Patient Bed, Semi-pneumatic and electrical.
- Portable suction Machine.
- Patient Bed-head
- Ventilators and ICU Machines / Equipments
- Infusion pumps
- Ultrasound machine
- Radiation Machine and Accessories
- Theatre equipment and machines
- Nurse call systems
- Ultrasound machine
- Radiation Machine and Accessories
- Theatre equipment and machines
- Nurse call systems
- Medical gases system.
- Bed head fitting and accessories.
- Potable X-ray Machine
- Portable operating lights
- Patients Monitors

ELECTRO-MECHANICAL EQUIPMENTS

- ATS, Distribution boards and switch-gears
- Diesel Stand-by Generators, Compressed Air plant, Steam boilers.
- Heat exchanges and calorifiers.
- Electrical and gas cookers,
- Laundry Equipments,
- Water pump and pumping station,
- Fire Alarms and Fire safety systems, Accessories and equipments
- HVAC, Refrigeration, Chillers and Air conditions In Hospital and General
- CCTV and Access controls

ROLE OF ENGINEER IN HOSPITAL

- Application of scientific Knowledge, skills and expertise to on facilities and equipment
- Ensure all Facilities are serviced, efficient and available for operation at all time
- Ensure clean and reliable utilities are available water, electricity, gases, sewer, steam etc
- Ensure planned Preventive Maintenance are scheduled and attended on time
- Ensure Breakdown are attended on time
- Attend on new project are addressed well
- Ensure necessary calibration for Equipments is updated
- Ensure Statutory documents are up to date.

NORMAL ROUTINE TASK FOR ENGINEERS

EFFECTS OF COVID-19 TEAM

- With declaration of COVID-19 in Kenya early March 2020 it brought panic, fear and confusion in medical field including Engineers in the Hospital.
- From Board room briefing, Engineers we called up to come with Check points, temperature detectors, special Isolation rooms, dedicated furniture,

  Equipment and Medical gases

COVID-19 SAMPLES HARVESTING BOOTH

THANK YOU AND PRIVILEGED TO SAY SOMETHING IN THIS FORUM

Solution for any society is always offered by Team from within. Every where in world Including during this time of COVID-19.

Local manufacturers (JUA KALI sector) has played a big role

which formed a solution for our local

- People
- Hospital
- School
- Agriculture
- Many a time
- During COVID-19 era what has worked is the local items

INNOVATIVE LOCAL SUPPLY

- Masks
- Temperature Guns
- Hand Sanitizer
- UV lights
- Ventilators
- Local

TEMPORALLY COVID-19 HOSPITAL

HOSPITALS WERE FORCED TO IMPROVE ON FACILITATES

- ICU Furniture
- Medical Gases
- Utilities
- Operation /working hours
- Supply

APPRECIATION

- We embrace the role played by Facility Engineers during this Era
- Your role has improved a lot the Medical institutions and Health Sector in General
- We need to keep our spirit high
- Embrace new and modern technology both local and imported
- We also need to embrace our fellow Engineers who has lost their life to COVID-19

Ephraim Nderitu

Facilities Officer B-ES Kenya

Biomedical Engineering Solution (K) Ltd.
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Tel: +254789526122 +254736997327, +254715383877,
Email: info@biomed-eng.com; sales@biomed-eng.com; marketing@biomed-eng.com

Engineers: For Hospital and General Institutions **Specialized in:** Biomedical, Electrical, Plumbing, Mechanical, Civil / Building, Training Consultancy, Sales and Services

Easy **Drain**

INTRODUCTION

Easy Drain Care Products has a long and rich history in healthcare and in the innovation of health care devices around the globe. Headquartered in Dallas/Ft. Worth and Westlands, Nairobi- Kenya under the company's subsidiary, Edrain Healthcare Products, – our staff of dedicated professionals will provide you with the best solution to your loved one's long-term, bed rest and healthcare needs.

With years of medical and health care experience Easy Drain Care Products developed health care products with medical staff and patient's needs -first and foremost. Easy Drain saw the needs of patients with prolonged bed rest. They had specific incontinence, health and comfort issues. Easy Drain's innovation meets those medical needs. Partner with us as we change healthcare around the globe.

THE THREE FUNCTION EASY DRAIN ELECTRIC DELUXE BED

The bed has castor wheels with two brake pedals. This allows for ease of movement even on carpeted surfaces. The bed has optional studs on all four corners for extra stability. The bed has a drainage system built into it. The collection chamber in the middle of the bed consists of the support tray, the collection funnel, the drainage tube and the collection tank. The collection funnel is underneath the sleeping surface supported by a holding tray.

The bed can be raised 82 cm and be lowered to 46 cm. It has jiengcang motors. The head and foot can be raised and lowered to 45 degrees. It comes with castor wheels with two brake pedals. This allows for ease of movement even on carpeted surfaces. The bed has optional studs on all four corners for extra stability.

Weight capacity is 700lbs for the safe Three Function Electric Deluxe Bed operation of the bed. The sleeping surface is 203x89cm and dimensions is 213 * 114* 60 cm

The chamber supports the special mattress and silicone cover with the drainage tubules. • The collection tank is anchored on the side of the bed for easy emptying and cleaning. • It has a two-year factory warranty on parts and labor. • Return Policy: Feel free to return the bed within days from the date of purchase. Only non-used beds in the original package can be returned. Any used beds cannot be accepted for return requests.

Features and benefits of the Easy Drain Medical Bed and Mattress - Urine Draining System

- Eliminates pooling of fluids on the sleeping surface
- Provides utmost comfort and care for one suffering from incontinence
- Improves overall patient hygiene
- Affordable solution for incontinence management
- Saves time and money
- Water proof mattress easy to clean and sanitize

- Reduces falls associated with toileting and transfers.
- Reduces UTI's and CAUTI's
- Eliminates rashes associated with the uses of diapers
- Promotes health and better sleep quality
- Reduces caregiver workload

CONCLUSION

Easy Drain self-drainage beds offers comfort and care for your loved ones thus being a very convenient tool for both the care givers and patients. We understand these facilities expect the very best and highest-quality devices to not only care for clients but to also assist all staff perform their jobs better and more efficiently.

The right therapy with every connection

Reduce the risk of VTE in your facility by tailoring therapy with the Flowtron ACS900 pump and SmartSense Automatic Garment Recognition technology.

The challenge

Caregivers are often under a lot of pressure in their daily work. They may even struggle to find time caring for their patients, let alone supporting the use of mechanical prophylaxis. The Flowtron solution is designed to help address caregiver challenges such as:

- Lack of time and resources
- Time spent on non-patient activities
- Managing inventory and troubleshooting equipment
- Multiple systems and new technologies
- Need for continuous training and education
- Tending to non-compliant patients
- Being responsive to individual patient needs

Flowtron ACS900 pump

A single pump that offers both uniform and sequential compression via a variety of garment types, reducing the need to have multiple pump models in the facility. The easy-to-use Flowtron ACS900 makes it simple to tailor VTE prevention with one pump covering all therapy needs.

SmartSense Automatic Garment Recognition

Arjo's patented garment detection technology automatically sets the correct pressure and compression cycle, without the need for any additional user intervention. Simply attach the snap-lock connectors to the Flowtron ACS900 pump and the system easily and safely does the rest.

At Arjo we help create safer and more efficient healthcare environments. From patient handling and mobilisation to hygiene and pressure injury prevention, we offer a range of solutions designed to help you meet the new and continually evolving challenges of today's acute care and long term care settings.

Our offering includes products and solutions for patient transfer, hygiene, disinfection, prevention of pressure injuries and deep vein thrombosis (blood clots). We also offer medical beds and various services, such as equipment assessments, architect guidance and training on all product categories.

Arjo Africa Exports
Arjo.Africa@Arjo.com

arjo

Role of a Medical Engineer in **Hospital Projects (Equipment Planning)**

TYPES OF HOSPITAL PROJECTS

- Refurbishment
  - Mainly deals with replacement of aging equipment of upgrading
- New Hospital
  - Planning from
  - Need assessment, Selection through Installation and Commissioning.

PLAYERS IN HOSPITAL PROJECT

CLINICIANS:

Usually express an interest in obtaining the latest and greatest technologies. Some of them might also:

- Advocate a certain vendor or OEM.
- Cutting edge technology is also a source for temptation for some of them.
- They also might exaggerate on the quantity of the technology.

It becomes the Medical Engineers responsibility to make sure that technology is not underutilized; it is serviceable, cost effective in long term usage and conforms to human factors engineering!

ADMINISTRATORS

Want to maintain their budget while obtaining good technologies. Medical engineer needs to make sure that safety and quality is not compromised in any way and all requirements (including work load which would impact the quantity of equipment) for the clinicians are met!

PROJECT MANAGES:

Want every thing to fit in the approved budget and rely heavily on the Medical Engineer to convey to them the clinical needs of the project. Since Medical Engineer is closer to the clinicians they often use Medical Engineer as:

- A Shield against the turf battle
- Medical Engineer acts as the middle person in driving the whole process of clinical facility design /renovation, hence is the missing link in the whole situation so there is always undue pressure on them.

TRADITION ROLE OF MEDICAL ENGINEERS/ ENGINEERING TECHNICIANS

MEDICAL ENGINEER

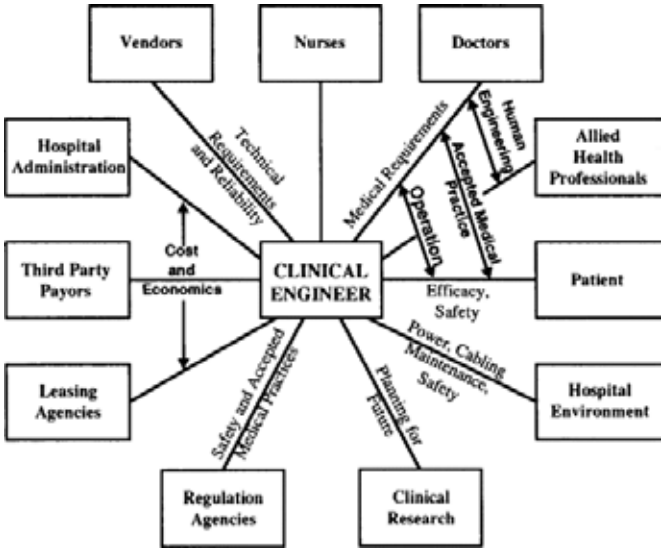
- Keep and Update Equipment Inventory
- Equipment Acquisition
- Equipment Service Maintenance
- Corrective Maintenance
- In Coming Equipment Testing
- Service and In house Contracts
- Train user on correct and safe use of medical devices
- Personnel Management.

MEDICAL ENGINEERING TECHNOLOGIST/ TECHNICIAN

- “Perform PMs, repairs and calibrations to most Diagnostic and Therapeutic Medical Equipment and maintain associated records”
- “Diagnose and correct system and equipment malfunctions”
- “Log new devices into computer inventory database upon receipt and inspection”
- “Solve organization-level customer service issues and complaints”
- “Report all patient safety issues to supervisor or manager and assist with correction of issue as required”

- "Participate in pre-purchase evaluation programs"
- "Purchase parts"
- "Assist in identifying and recommending replacement of equipment that is obsolete, has extensive repair history, or has identified safety issues

MEDICAL/CLINICAL ENGINEER



EQUIPMENT PLANNING

A Good equipment planning includes careful Attention to fixed and movable equipment that will be needed in operations.

The lack of planning will result

- Wastage of millions of Shillings
- Reduced Operational efficiency
- Lower standards of patient care

WHOSE RESPONSIBILITY?

(a) It is the responsibility of Hospital Medical Engineer to
  - Determine all the items of equipment necessary
  - write their specification,
  - recommended bids (tender) & purchase according to hospitals policy. (Expendable, non-expendable & capitals equipment)

(b) The Architect is responsible for the Built in equipment.

When & in which stage equipments Planning is done?

(i) Equipment planning is done Early in design dev. Stage. This planning involves.
  (a) A series of Meetings of
    - Medical staff
    - HODs &
    - Other Staffs

    to discuss the needed equipment
  (b) Preparing Room by Room Equipment List
  (c) Review of this list by
    - Administrator
    - Medical staff
    - Departmental heads

  Another detailed Equipment planning is necessary at final FURNISHING & while actually EQUIPPING the hospitals

DESIGNING FOR EQUIPMENT

- A set of black line points of working Drawing (Floor Plans only) should be secured from Architect and marked up in advance all Gross equipment shown to scale & identified
- It is done in designing phase

NATURE OF EQUIPPING THE HOSPITALS

- It is an extensive and exhaustive work because it involves not only the degree but a variety of technical knowledge.
- There are innumerable expandable items, which should be procured and stoked in sufficient quantities.

SELECTING THE EQUIPMENTS

- Selection of Technical, Scientific and Medical Equipment requires careful Analysis of the needs of each department and conscientious study that will result in selection of needed equipment.
- The present day High-tech medical equipment. is mind-boggling to even medical experts that the Medical Engineer may be easily stumped out

Role of a Medical Engineer in **Hospital Projects (Equipment Planning)**

EQUIPMENT PLANNING SERVICES

- High-Level Medical Technology Assessment Reports
- Room-by-Room Medical Equipment Schedules
- Bill of Quantity Reports & Budget Estimates
- Room Data Sheets (RDS) & Room Layout Sheets (RLS)
- Detailed Tender Specifications
- Tender Documents & Evaluation Management
- Procurement Management
- Supervision of Delivery, Installation and Commissioning
- Training Coordination & Hand Over

COMPETENCIES AND SKILLS REQUIRED

- Excellent problem solving skills.
- Excellent program and project management skills. Excellent interpersonal communication skills.
- Have advanced skills with spreadsheets, databases and other required computer applications.
- Have ability to read and interpret blue prints and other architectural design documents.
- Have Knowledge of medical facilities and the functions/procedures performed in facility spaces.
- Knowledge in Auto-Card, Archi-card, 3D, Revit etc Softwares
- Strong knowledge and understanding of the function of medical equipment and medical terminology.

CONCLUSION

The whole process of equipment planning is a race against time. A Medical Engineer

- Needs to make instant decisions based upon available data or information.
- Needs to take initiative and search for the important information on the basis of which he would base his decision.

This information encompasses:-

- The current inventory of equipment in the
- The exact needs for equipment,
- The best pricing,
- Knowing the exact architectural plans as they go through revisions so as to keep tabs on the space available for equipment to be housed,
- The exact budget available for the project, various deadlines for the project, delivery time-lines etc.
- The key to information acquisition is in knowing where to get the right information and more importantly to know who can provide with such information. Thus good people skills can have a very positive impact on endeavors.
- A Medical Engineer needs to be in the same wavelength while interacting with people within his/her work to understand their needs.

Anyango P. Amoko

Consultant Medical Engineer

Mindray **Kenya**

ABOUT MINDRAY

Founded in 1991, Mindray is one of the leading global providers of medical devices and solutions. Mindray possesses a sound global R&D, marketing, and service network with 10000+ employees and 40 subsidiaries and branch offices in 31 countries. Its products

and services serve healthcare facilities in over 190 countries and regions.

MINDRAY KENYA

Mindray's presence in Kenya can be dated back to 2006. Since then, Mindray products have continued to serve more and more healthcare facilities in Kenya. To meet the increased need for healthcare support and better serve customers and patients in Kenya and neighboring countries, Mindray Kenya was newly established on October 1st, 2021. Mindray Kenya will work with local partners to make healthcare more accessible in this region.

Mindray Kenya office Opening ceremony 2021.10.1st

MINDRAY INNOVATION AROUND THE WORLD

Mindray has been dedicated to sharing medical innovations with the world.

Meaningful innovation in North America

North America has set high standards for innovation to ensure consistent quality care which meets the evolving needs of a diverse healthcare landscape. Mindray North America is headquartered in Mahwah, New Jersey. Its Ultrasound Innovation Center is located in the technology hub of San Jose, California. In 2008, Mindray acquired Datascope's patient monitoring business and has become one of the world's leading brands in this segment. Mindray's commitment to the U.S. marketplace has been reinforced by the acquisition of Zonare in 2013, a leader in ultrasound technology.

In the US, Mindray has partnered with all major buying groups, and our products are installed in more than two-thirds of all U.S. hospitals. Additionally, Mindray solutions are at work in all 20 of the best hospitals in the U.S., as defined by the 2019 U.S. News & World Report. Also, Mindray products are serving 2/3 of medical institutions in the U.S.

Tailoring integrated solutions for Europe

For 20 years, Mindray has been investing and expanding its presence across Europe. To meet the diverse demands and high standards of Europe's top hospitals, Mindray has established 7 subsidiaries across the continent, over 1,000 value-added service engineers who are based across 6 service centers deliver timely and professional operational service to all its customers.

Through continuous innovation, Mindray is recognized by more than 400 teaching hospitals in ICU, E.R., etc., to become one of Europe's most trusted partners for medical professionals.

Royal Infirmary of Edinburgh, UK

Centre Hospitalier Universitaire de To

Reliability at the heart of everything

Mindray understands the vital role medical devices play in patient treatment. Quality is always its top priority. To ensure that all Mindray products are safe, effective, and reliable, Mindray identified five key phases to carry out strict quality control protocols. These are engineering design, supplier quality assurance (SQA), manufacturing, service and training, and post-market surveillance. The work of each link in this cycle is carefully managed due to its impact on the following link, and the eventual effect on the quality which we provide to our users. Mindray products have gained the additional stamp of approval in the shape of FDA certification in the U.S. and C.E. safety certification in the European Union. Mindray had also established the first standardization lab in China in 2005. The lab calibrates test systems and reference measurements, ensuring the accuracy of all test results can be traced back to the original reference standards.

Benefitting from stringent quality control and a large production capacity, Mindray can deliver high-quality products to customers across the globe. Mindray builds quality into every aspect of Mindray's solutions. Quality management is integrated into the whole production process, from research and innovation, design and manufacturing, and finally, testing and procurement processes.

TOTAL SOLUTION FOR HEALTHCARE

Total Solution capitalizes on Mindray's broad product portfolio and offers hospitals a holistic and systemic solution to improve overall efficiency and quality of care. It provides hospitals with a one-stop sourcing platform and a customizable solution, including standardized hardware and software interfaces to improve operation, safety, and success rate.

With Patient Monitoring & Life Support, Mindray provides emergency care, perioperative care, critical care, and other sub-critical solutions.

In the field of In-Vitro Diagnostics, comprehensive laboratory solutions are offered for labs of different sizes.

Mindray's Medical Imaging solutions also achieve full coverage of clinical applications.

Monitoring and Evaluation as a tool for quality **assurance and control in our healthcare institutions**

DEFINITION OF TERMS

Quality assurance is a set of activities for ensuring quality in the process by which products are developed. QA aims at preventing defects with a focus on the process used to make the product. It is a proactive quality process. The goal of QA is to improve development and test process so that defects do not a rise when the product is being developed. Example of quality assurance is verification. Who is responsible for quality Assurance, All team members

Quality Control is a set of activities for ensuring quality in the product. The activities focus on identifying defects in the actual products produced. Quality control aims to identify and correct defects in the finished product. Quality control therefore is a reactive process. The goal of Quality control is to identify defects after a product is developed and before its is released to the market. Validation /software testing is an example of quality control. Quality control is usually the responsibility of a specific team that tests the product for defects

GOING FROM WORK PLAN TO M&E

Look at your activities and sub activities and ask yourselves these questions.

- What information do you need on a continuous basis to make sure your activities are being carried out properly?
- How will you collect that information?
  (site visits, facility data, maintenance activities data minutes, meetings, informant interviews)
- What information do you need to determine the quality of those activities.
- How could you collect that information? Do you need baseline data?
- What information do you need to determine if your objectives are being met, your activities are having the desired impact?

KEY CONCEPTS USED IN M&E

Efficiency: The amount of outputs created and their quality in relation to the resources invested. This is usually measured in terms of cost incurred in the process.

- Outputs are direct measurable results (goods and services) of the project which are largely under project management.
- Is the project delivered in a timely and cost effective manner?

Effect: The more immediate, tangible and observable, in relation to initial and established objectives, which has been brought about as a direct result of project activities.

Effectiveness: This expresses the extent to which the planned outputs, outcomes and intended impacts are being or have been produced or achieved. It expresses the extent to which a project/programme achieves its objectives.

- To what extent does the intervention achieve its objectives? What are the supportive factors and implementation?

Impact: This refers to the long term, largely indirect consequences or end products of the project/programme for the intended beneficiaries.
Impact can be positive or negative.
Impact can be unpredictable

- What happened as result of the project?

  Impact Vs. outcomes

  Outcome refers to changes in the way people do things as result of the project e.g. Biomedical engineering professionals engaging in design and manufacturing of simple medical equipment.

  Impacts are long term, e.g. lowered importation of the locally manufactured equipment.

Relevance: The extent to which the project/programme is addressing or has addressed the problems of priority, mainly as viewed by the beneficiaries.

Sustainability: This means the maintenance or positive changes induced by the programme after its phase out.
It is 'a withdrawal strategy' of the project/programme.

- Are there lasting benefits after the intervention is completed?

Replicability: The feasibility of replicating the particular programme or parts of it in another context.

METHODS OF MONITORING

Reports: Written or verbal concerning particular aspects of work progress as per execution plan, any special problems or difficulties and how they have been solved.

Visits: Very important as they add the human touch and ensure first hand information and boost staff morale.

Checklist: It ensures all relevant aspects of the work have been enquired into. There has been no oversight because of the pressing problems.

Meetings: Important to review and alter local targets and future planning.

Complaints/compliments: Complaints are good indicators that there is something wrong, they must be followed up. On the other hand compliments are indicators that things are good.

IMMEDIATE BENEFITS OF MONITORING

In healthcare delivery regular monitoring will lead to us avoiding common problems like;

- Shortage of spare parts due to delayed ordering.
- poor maintenance of machines and equipment.
- Reduced life value of machines and equipment.
- low customer satisfaction due to denied services.
- High mortality rates of our patients.
- High operating costs for our health care delivery institutions.

IMPORTANCE OF MONITORING

- **Project management, staff and stakeholders:** provide continuous assessment of plans, resources, infrastructure, and use of services by beneficiaries.
- **Donors and stakeholders:**

Increase project accountability.
Improve planning, Donor satisfaction, project quality, and enhance learning from experience.

- **Managers and staff:** Opportunity to reinforce initial positive results, strengths and success.
- **Target group:** Check condition and changes brought by the project activities. Check if assumptions are valid.

EVALUATION

Is a Periodical and systematic process of gathering information to make judgments about a project's achievements.
Episodic or periodic assessment of the project interventions and their impact (both expected and unexpected) in relation to stated objectives.

Evaluation measures:

- The extent to which change in outcomes can be attributed to the project.
- The difference in outcome of interest attributable to the project is the 'impact'.
- Evaluation of this kind is known as impact evaluation.

FIVE BASIC QUESTIONS OF EVALUATION

- What was intended to happen (objectives)?
- What has actually been achieved so far compared with objectives?
- What value should be place on the methods used (process)?
- What can be made of the information gained from question 1, 2 and 3 (feedback)?
- What is the while exercise teaching us about managing future activities?

TYPES OF EVALUATION

TYPES	PURPOSE
Formative	Initial assessment of the target population and contextual environment. Determines concept and design
Process	Seeks to identify the extent to which planned activities have been achieved and assesses the quality of the activities/ services.
Outcome	Examines specific project outcome and accomplishment. What changes were observed. What does it mean and if changes are a result of the interventions.
Impact	Gauges the project's overall impact and effectiveness. Aims to strengthen design and replication of effective projects and strategies.

A COMPARISON OF MONITORING & EVALUATION

MONITORING	EVALUATION
Continuous process	Periodic
Focuses on the activities being implemented according to plan.	Focuses on the process and the results.
Answers questions on what, when how.	Answers questions on how well and why.
Acts as an early warning system.	Identifies lessons for new projects.
Done internally by the project staff.	Done internally or externally.
Hands on; eyes on.	Eyes on Hands off.

CHALLENGES IN MONITORING AND EVALUATION

WHY MONITORING & EVALUATION?

- Monitoring & Evaluation should be part of the design of a program.
- Ensures systematic reporting
- Communicates results and accountability
- Measures efficiency and effectiveness.
- Provides information for improved decision making.
- Ensures effective allocation of resources.
- Promotes continuous learning and improvement.

Collectively, the M&E system must provide the answer to the question Are we making a difference

Mr Dennis Nyarangi

(Bsc.Ppm, H Dip Ent Edu, H Dip Ele Eng , Dip ppm, Dip Me)

ZOLL leads the way in SAVING LIFE

Hargain Healthcare Ltd

- **Unlike any other AED's that use expensive manufacturer lithium batteries this one uses locally off Uses less expensive, off-the-shelf, lithium 123A batteries which last (five) 5 years**
- **An embedded CPR assist with the electrodes to guide the medical personnel.**
- **Less Maintenance**
  - Five (5) year battery and pad life hence fewer replacements, less maintenance and increased AED readiness.

In stock

For pricing and other inquiries
Contact us on +254 722301755
peris@hargainhealth.com

ZOLL®

Discover Noninvasive Continuous Monitoring with SpHb® and PVi®

Multiple studies have demonstrated the clinical utility of continuous haemoglobin monitoring, SpHb, and pleth variability index, PVi, an indicator of fluid responsiveness.* SpHb and PVi are now incorporated into society recommendations[1,2] because they give clinicians timely information and trended data to enhance patient care.

Align with Recent SABM Recommendations

A whitepaper from the Society for the Advancement of Patient Blood Management on improving outcomes states that "continuous access to Hgb levels in real time offers a clear advantage...as it enables the clinicians to detect changes in Hgb levels quickly and adjust the clinical management strategies accordingly."[3]

Conserve Essential Resources

87%

A study of 327 patients undergoing elective orthopedic surgery, conducted at Massachusetts General Hospital, found that the use of SpHb monitoring reduced the rate of transfusions by 87% when compared to the standard of care.[4] Reducing unnecessary transfusions may help reduce blood shortages and overall spend on blood.

Supporting You With Your Hospital Initiatives

Enhance Patient Outcomes

33%

A study of 18,716 patients in the OR, ICU, and PACU, with a goal-directed therapy protocol with PVi and SpHb, demonstrated reduced 30- and 90-day post-surgical mortality by 33% and 29%, respectively.[5]

Improve Care Team Efficiencies

SpHb and PVi can be displayed on Masimo and select third-party monitors with the use of a multi-wavelength pulse oximetry sensor, which can help centralise patient data and increase its accessibility to care teams.

[1] SABM Administrative and Clinical Standards for Patient Blood Management Programs 5th Edition. Publications. 2019. [2] Vaglio S, et al. *Blood Transfus*. 2017 Jul;15(4):325-328. [3] SABM. Improvement of Patient Outcomes with Hemoglobin Monitoring in the Critical Care and Perioperative Setting. Publications. 2021, January. [4] Ehrenfeld JM et al. *J Blood Disorders Transf*. 2014. 5:9.2. [5] Cros J et al. *J Clin Monit Comp*. 3 Aug 2019.

Clinical decisions regarding red blood cell transfusions should be based on the clinician's judgment considering among other factors: patient condition, continuous SpHb monitoring, and laboratory diagnostic tests using blood samples. SpHb monitoring is not intended to replace laboratory blood testing. Blood samples should be analysed by laboratory instruments prior to clinical decision making. * For select populations of mechanically ventilated adults. The accuracy of PVi in predicting fluid responsiveness is influenced by numerous patient, procedure, and device-related factors. PVi does not measure stroke volume or cardiac output. Fluid management decisions should be based on a complete assessment of the patient's condition.

Caution: For professional use. See instructions for use for full prescribing information, including indications, contraindications, warnings, and precautions.

Masimo

masimo.co.uk/sphb-outcomes

Healthcare Technology Management Amid the **COVID-19 Pandemic in Low Resources Countries**

SAFETY OF MEDICAL DEVICES

Health technology management (HTM), also known as "clinical engineering" is an area of biomedical engineering that entails planning, needs assessment, procurement, installation and maintenance of medical equipment, training for safe use and finally decommissioning. For effective implementation of HTM, competent and skilled personnel are required in both the managerial and technical level.

In a Biomedical engineering department of a medical facility, the skilled workers include technicians and biomedical engineers. The technicians and engineers are tasked with the installation, maintenance, repair and provision of technical support for biomedical equipment. In the stated roles of a biomedical engineer, ensuring equipment safety is paramount. After installation, maintenance and/or repair of medical devices, the biomedical engineers should test and analyze the stated medical devices to ensure they are functioning as per the manufacturer's recommendation to guarantee patient safety.

It has become clearer during this period of the COVID-19 pandemic that the role of a biomedical engineer is key to successful treatment and management of patients who have contracted the disease. The pandemic has seen an increase in the purchase and installation of patient support medical devices such as patient monitors, ventilators, oxygen concentrators and hospitals beds across various healthcare facilities in the country.

A medical facility cannot afford to have a defective medical device in use. A defective patient monitor can produce wrong patient vital signs which when used during diagnosis and/or inferred by a doctor to recommend treatment can pose a greater risk to the patient. A ventilator machine that delivers excess flow rate than the set value can expose a patient to volutrauma. A poorly grounded electric hospital bed may expose a patient to mild electric shock or even death by electrocution. Therefore, it is important for Biomedical engineers to follow the laid down protocols and guidelines required to test and analyze all the medical devices at their disposal. In the case of the patient monitors, one should test and confirm that the units relay the actual readings of the vital signs as captured from a patient. For a ventilator, the biomedical engineer should ascertain the flow rate, humidity levels, oxygen concentration and airway pressure of gases being produced by the unit. Similar test and measurement should be done across the various medical devices to guarantee patient safety.

Health care facilities need to collaborate with authorized distributors of medical and biomedical equipment to ensure that they get value for their investment. What is value and how can a facility maximize on the same? Value means getting equipment of high quality, that comes with all necessary accessories and a warranty. Value also means that the supplier or distributor should be able to support the facility (buyer) and end user (engineer/technician) through training, installation and commissioning of the equipment. An equipment is only as useful as its user. Therefore the better equipped or skilled the user the more value that is derived from the equipment. Should the equipment malfunction, then the warranty comes into place and ensures a smooth experience where one need not pay extra to have the equipment repaired. Amotech Africa is one such distributor, having been in the market for close to ten years, Amotech Africa has grown an established itself as the go to partner for premium test and measurement solutions. Through its partners, Fluke Biomedical and Raysafe, Amotech Africa has been and continues to provide biomedical solutions that meet the unique needs of every customer. Amotech Africa believes in walking the journey with the customer and offering quality after sales support to give the client maximum value for money. Amotech Africa works closely with the engineers who are the custodians of ensuring only safe medical devices are used on a patient. As a partner, the firm through its key account managers and the marketing and communication department, stays abreast with the changes and new technologies in the ever-changing biomedical filed and communicates the same to clients. This helps the firm's clients and partners to leverage on new developments that will add value to their work and in turn the facility that they work in.

In conclusion, routine and accurate test, analysis and measurement of medical devices will go a long way in ensuring only safe medical devices are recommended for use on patients. All stakeholders need to play their part in enhancing safety and ensuring medical facilities can provide quality services and treatment especially during this time of a pandemic that has stretched most hospitals due to the spiked demand for treatment related to the COVID-19 pandemic.

Brian Ingasia

MSc Biomedical Engineer

HOCI SUCCESS STORY: FAME HOSPITAL IN KARATU, TANZANIA

The Foundation for African Medicine and Education (FAME) operates a not-for-profit clinic and hospital in Karatu, a rural district in Tanzania. The hospital has 14 inpatient beds, two operating rooms, a laboratory and a 24/7 emergency room. The hospital also has a 10-bed isolation ward for COVID patients and a 24-bed maternity ward.

Several months ago, Hypo Source approached FAME about purchasing the Hypo 7.5 hypochlorous acid machine. Egbert Chogo, the hospital's pharmacist, lead the effort to integrate HOCl in the hospital.

Hospital workers are trained in how to operate the Hypo 7.5 machine. They run the machine on average about an hour a day each week.

Prior to switching to hypochlorous acid, the hospital cleaning staff was primarily using JIK, a local brand of bleach (3.5%strength), which cost about $0.85 per liter. Because of the increased patient load and sanitation concerns brought on by Covid 19, the hospital was using about 100 liters of Jik or about 700 liters of dilute bleach solution each week.

In other words, they were spending about $85 per week on bleach. This included bleach used in the cleaning solutions as well as for general sanitation.

Egbert said that during the first wave of the pandemic, the hospital experienced difficulties in procuring bleach due to supply chain shortages. Even after the supply chain had stabilized, the prices of bleach remained high due to increased demand. But with the Hypo 7.5, Egbert and his team can now make 7.5 liters of hypochlorous in 8 minutes at a cost of about $0.02 USD per liter. After reviewing cleaning protocols, Egbert reports that they are now using 500 liters of hypochlorous per week. At 2 cents per liter, the hypochlorous costs about $10 per week, compared to the $85 they were spending for Jik. In other words, an 800% cost reduction.

Now, the hospital uses hypochlorous produced onsite in the Hypo 7.5 each day to disinfect all areas after they have been given a preliminary cleaning with soap and water. The raw materials for the hypochlorous are easy to find, protecting the hospital against future supply chain disruptions. Bleach is now only used to whiten the hospital linens.

Switching the hospital's cleaning protocols from bleach to hypochlorous wasn't difficult, Egbert said, but it took some time for the staff to become accustomed to the new cleaning procedures and reduced disinfectant use. He hopes to introduce the hospital to using hypochlorous for wound care in the future, once staff have had a chance to get more familiar with the machine.

FAME Hospital is a great example of why we designed the Hypo 7.5. Our vision for this machine was to give clinics and hospitals, particularly in rural areas or with vulnerable populations, the ability to increase their self-sufficiency and improve sanitation conditions. We look forward to seeing the progress of Egbert Chogo and FAME!

The Hypo 7.5 makes a powerful disinfectant and sanitizer using only salt, water, vinegar and electricity.

The Hypo produces 7.5 liters (2 gallons) of hypochlorous acid (HOCl), which can replace bleach, ethanol alcohol, quaternary compounds, iodine, wound dressings, food sanitizers, water treatment, and crop dressings. The premium titanium-coated electrolysis cell ensures a long life in rugged conditions with a wide tolerance of inputs. The machine comes with a 5-year or 2,000 hour warranty and is made in the USA.

- **AFFORDABLE AND EASY TO USE — NO COMPLICATED INSTALLATION**
- **OPTIONAL SOLAR POWER MAKES UNIT FULLY AUTONOMOUS**
- **PRICED 60% BELOW COMPETING FLOW SYSTEMS**
- **MAKE 200, 500, OR 1000 PPM SOLUTIONS IN 8 MINUTES OR MORE**
- **4,000 HOUR EXPECTED CELL LIFE AND 5-YEAR WARRANTY**

PPM STRENGTH	CYCLE LENGTH
200 PPM	8 MINUTES
500 PPM	20 MINUTES
1000 PPM	40 MINUTES

WHAT IS HYPOCHLOROUS ACID?

Hypochlorous acid (HOCl) is naturally produced by the white blood cells of all mammals to destroy pathogens. It is a non-toxic substance that is approximately 80 times more effective than hypochlorite (bleach) at killing E. coli bacteria. HOCl has been in use since WWI, but it was difficult to produce and stabilize. Recent advances in electrolysis technology have now made it possible to create HOCl with machines like the Hypo. HOCl is used as a disinfectant and sanitizer in industries such as healthcare, airlines, agriculture, and hospitality. The USDA has approved HOCl for application directly on food and it is listed by the EPA as being effective against COVID-19. Hypochlorous is incorporated into wound care products and sold as a natural cleaning agent.

PRODUCT OVERVIEW

Manufactured in the USA for Hypo Source, Saint David, Arizona, USA | support@hyposource.com

German Engineering Inspires **Vocational Training in Kenya**

In September 2021 an outstanding Kenyan-German cooperation project was completed. "Skilled workers for the Food Industry" addressed the shortage of skilled workers in the industry by working closely together with companies in this sector to offer courses in vocational training.

The German Mechanical Engineering Industry Association VDMA launched the project in January 2018, offering technical training programs in Nairobi through its service company VDMA Services GmbH and in cooperation with local training centers. The project was supported by the DEG – Deutsche Investitions- und Entwicklungsgesellschaft mbH. The training programme comprised short technical courses on "Food Safety in Food Processing" and "Maintenance Organization and Planning," as well as a train-the-trainer course. Additionally, several Exchange of Experience Workshops with both local company representatives and German company representatives were held in Nairobi. The purpose of these Workshops was to network with each other, share and exchange ideas and knowledge.

The training concept was tailored to the needs of the Kenyan food industry and supported by German technological and engineering expertise. It was based on the dual-track approach that lies at the heart of Germany's vocational system: an approach that combines theoretical and practical training. This approach has been around for decades and is deeply embedded in German society. This system is one of the key foundations of German engineering's prowess.

VDMA: LARGEST EUROPEAN NETWORK ORGANIZATION FOR MECHANICAL ENGINEERING

With a workforce of 1.34 million people, the mechanical engineering sector is Germany's largest industrial employer. It accounts for 9 percent of the German workforce and for 27 percent of income tax revenue and social security contributions. With more than 3,300 members, the VDMA is the largest network organization for mechanical engineering in Germany and Europe. The majority of the VDMA members are small and medium-sized companies – many of them family-owned. Innovation is at the heart of these businesses. No other German industry invests more in research and development - around 5 billion euros every year. This

equates to 10 percent of the entire research budget for German industry. And this investment only pays off if companies can rely on a skilled and highly qualified workforce, which is why technical vocational education and training are of utmost importance.

SKILLS MAKE THE DIFFERENCE

Kenyan and German partners were united by the strong belief that investments in vocational training and education pay off, and that such investments can have a significant impact on the qualification of the nation's workforce. It would be great to share this view with stakeholders from other sectors, such as Medical Engineering. Bearing in mind that skilled workers are the backbone of every economy, industry-oriented professional training has the potential to elevate Kenya's economy to a new level. The VDMA is committed and eager to support the development of skills – for the sake of the people, who thereby have the prospect of a job and participation in social life, for the sake of Kenya's industry, which benefits from qualified personnel and, last but not least, for the sake of German industry, which can use such training programs as an entry point to growing markets.

Dr. Norbert Völker,

Head of Educational Policy International
VDMA

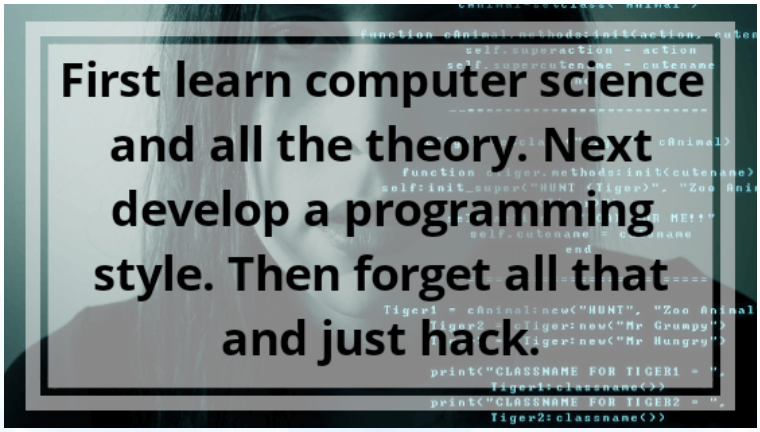
HUMOUR CORNER

CHOOSE A JOB YOU LOVE, AND YOU WILL NEVER HAVE TO WORK A DAY IN YOUR LIFE.

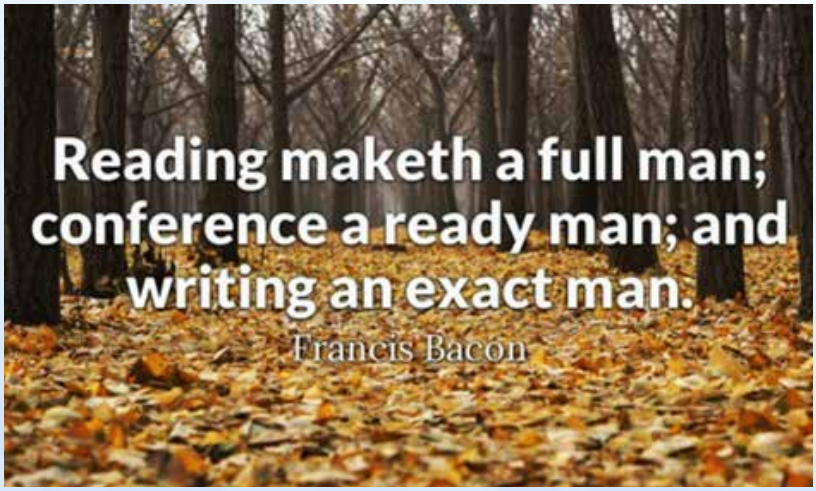
-CONFUCIUS

Free Information

Programming Quotes



Conference Quotes



Pictorial

The Vice President, Gradian Health System Ken Kaunda (on the left) and Anthony Kagiri (right) with AMEK officials.

Vincent Mulandi (centre) of Debra Limited with AMEK officials.

Veronica (centre) of Total Hospital Solutions with AMEK officials.

Enoch Musyoka of Equalize Health with AMEK officials

Peris of Hargain Healthcare with AMEK officials

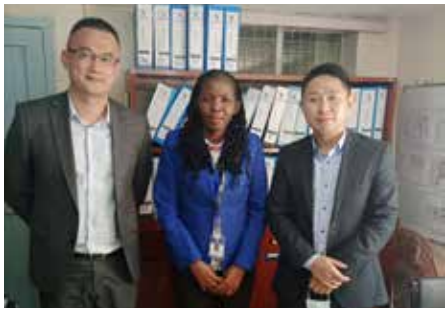
MD, Muchiri Muchiri Machacha (left) with Njeri Gachanja, Catherine Mwangi and Brian Lugadilu of Amotech Africa with AMEK officials.

Megascope Healthcare General Manager Renne Lupalo (right) and Technical Manager Peter Oketch (left) with AMEK offiicals.

Kunal (second left) and Bhat (second right) of Surgilabs with AMEK officials.

Eng. Millicent Alooh - MP Shah Hospital, CEO GE Healthcare, Jennifer Kinyoe, CEO Aga Khan Hospital Kisumu, Jane Wanyama Director General Health, Dr. Patrick Amoth Managing Director BOC, Marion Njeri, all celebrating women in Biomedical Engineering , on the International Women in engineering Day.

Director General of Health Dr. Patrick Amoth with AMEK officials during the Women in Biomedical Engineering Day, 23rd June 2021 at Crowne Plaza Hotel, Nairobi.



Mindray Directors with Eng. Millicent Alooh.

Daniel Matu, Operations Manager and Josephat Mogeni Lead Engineer, Angelica Medical Supplies with AMEK officials.

Pictorial

Participants marking Women in Biomedical Engineering Day, 23rd June 2021.

Pres briefing during Women in Biomedical Engineering Day

Director General of Health Dr. Patrick Amoth after opening the Women in Biomedical Engineering Day, 23rd June 2021 at Crowne Plaza Hotel, Nairobi.

Eng. Owino after opening the 11th Conference 2019 with delegates in Flamingo Hotel, Mombasa.

Eng. Owino, Susanah Munyiri, Deputy Director KENAS, Eng. Mike Talam (KENAS) with AMEK council members in Flamingo Hotel, Mombasa in 2019.

Association of Medical Engineering of Kenya Hon. Secretary General Eng. Millicent Alooh (right) addresses journalists at Uhuru Park, in Nairobi, over oxygen shortage in the country together with Eng. Peter Ayieko the National Union of Biomedical Engineers of Kenya Secretary General:

By George Kebaso
People Daily Digital
Tuesday, March 30th, 2021

AMEK press briefing during the launch of Biomedical Engineering Union in 2020.

Amos Mamati, AMEK Treasurer and Edward Matekwa, Chairman AMEK.


The hidden heroes in Covid fight

Launch of National Union of Biomedical Engineering.

02 International

WHO IS 02 INTERNATIONAL LTD.?

Together with Swedish Atlas Copco and United Kingdom-based Beacon Medaes, Nairobi-based 02 International was the Special Purpose Vehicle (SPV) that successfully submitted the winning Public Private Partnership project bid on 02nd July 2014 to the Public Private Partnership Unit (PPPU), Nairobi, under a Build-Own-Operate-Transfer (BOOT) model.

The PPP project was to distribute and manage supply of medical grade oxygen to all public hospitals in Kenya through finance, dimension, purchase, install, operate, maintain and commission of twenty-two (22) Atlas Copco/Beacon Medaes oxygen generating systems in eleven (11) Level 4&5 hospitals countrywide.

Crucially, the BOOT was to address numerous challenges encountered in outsourcing cylinder medical oxygen in public hospitals, as a consequence of the limited number of private suppliers and supplier monopolies existing since pre-independence, through on-site generation of medical oxygen.

WHAT DOES 02 INTERNATIONAL DO?

In line with the World Health Organization (WHO) 2017 decision to elevate medical oxygen on its Model List of Essential Medicines (EML), 02 International's medical gases systems Placement model allows hospitals, and healthcare facilities to realize the most competitive medical oxygen prices available on the Eastern Africa healthcare market.

With its extensive medical gases research as its guide, 02 International is constantly working to professionally address the specific medical gases challenges faced in the Eastern Africa healthcare market.

On a longer-term basis, 02 International Placements of Atlas Copco/Beacon Medaes medical gases systems + support equipment to both private as well as public hospitals aim at addressing:

- The extravagant prices charged for medical oxygen,
- The scarcity and quality of medical-grade oxygen, and
- Improvement in the medical oxygen generation-handling-storage-distribution infrastructure

HOW DOES 02 INTERNATIONAL DO IT?

In collaboration with Atlas Copco/Beacon Medaes, 02 International finances, supplies, installs, commissions, services and maintains, operates and finally transfers the medical gases systems to the host hospital. This translates to:

- Offering, probably the most competitive medical gases prices on the Eastern Africa healthcare market.
- Generating the highest quality and purity medical gases compliant to international medical standards.
- Offering healthcare facilities – both public as well as private – an economically viable alternative to capital-intensive investments in medical gases generating systems acquisitions.
- Storing the quality generated medical gases in the highest quality corrosion-free aluminium medical gases cylinders in three - 10L., 20L. & 50L. – sizes. Aluminium cylinders are 40% lighter than steel cylinders.
- Improving the medical gases generation-handling-storage-distribution infrastructure by piping the host hospital with the highest quality

Type K. & L. Copper pipe.

- One to two weeks of medical gases buffer infrastructure: 02 International professionally installed manifold supply system infrastructure does away with cylinders in the wards. Highest copper pipe quality Type K. & L. is used to set up the piping infrastructure.

^ Offer the home-care market choice in terms of:

- Highest quality aluminium cylinder sizes – 10L., 20L. & 50L.
- Highest quality and purity in generated medical gases
- Most competitive medical gases prices on the market

^ Quality medical-grade gases should not only be affordable but accessible to all.

^ Quality medical-grade gases should be of the highest international standards and medically recommended purity levels.

^ Longer-term view of the Eastern Africa healthcare market being among the key pillars our quality and most-competitive medical gases prices are built on.

A successfully submitted 2014 winning Public Private Partnership (PPP) bid to supply medical grade oxygen to all public hospitals in Kenya developed into a co-operation between three companies – *Atlas Copco*, *Beacon Medaes* & *02 International Ltd.* – to conceptionalize the *Placement* model.

The - medical gases - collaboration has been nurtured through the years and seen it grow from strength to strength.

The future in medical oxygen generation – duplex all-in-one medical oxygen generating system

- Class ii Medical device certified by Australian TGA
- ISO13485 for manufacturing and sales of medical devices

To learn more on how our medical gases systems Placement(s) can work for your hospital (private and/or public), healthcare facility, region, county, country, etc., visit us at 02int.com

02 International Ltd.

Underwriting healthcare – medical gases

Lighter-weight, quality aluminium cylinders

Medical gases buffer - manifold supply system

Quality and affordable medical gases should be every citizen's right

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PHILIPS Healthcare

Hargain Healthcare Ltd

Neusoft Medical Systems

EcoMed

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