



UNIVERSITY OF JAFFNA



Dr. M. Ganesaratnam
Memorial Lecture - 2020

Why do we Fail?

Delivered by:

Prof. Mohan de Silva MS, FRCS Edinburgh, FCSSL
Emeritus Professor Surgery and Consultant Surgeon

on

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at

Hoover Auditorium
Faculty of Medicine



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Delivered by

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Former Dean, Faculty of Medical Sciences, University of Sri Jayawardenepura

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Why do we Fail?

Dr. M. Ganesarajan
Memorial Lecture - 2020

Delivered by

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Director, National Cancer Institute, Singapore

Local and international cancer research and clinical practice
Family of related cancer research and clinical practice
Translational research and clinical practice
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Message from the Vice-Chancellor

Dr.Ganesaratnam was an eminent General Surgeon and Past President of College of Surgeons of Sri Lanka. Dr.Ganesaratnam contributed to the surgical fraternity of the country immensely and especially to the Northern Region of Sri Lanka during the most difficult times of recent past of Jaffna. He had given exceptional leadership during his tenure in Jaffna Teaching Hospital as Consultant Surgeon, well over two decades. He tirelessly performed surgeries in trying circumstances and difficult conditions to save the life of thousands of war victims. Moreover his contribution to the Faculty of Medicine of the University of Jaffna in conducting the teaching of Professorial and Clinical Surgery was most recognized and would be remembered forever. His selfless professional service is exceptionally of humanitarian nature.

I am very pleased that Dr.Ganesaratnam's trusted professional colleague, distinguished surgeon and former Chairman of the University Grants Commission Prof. Mohan de Silva had readily accepted the invitation of the Dr.Ganesaratnam Memorial Lecture Committee of the University of Jaffna to deliver the Memorial Oration 2020 titled "Why do we fail" in other words "how to get things right"

I am confident that Prof. Mohan de Silva's lecture would inspire many youngsters to take up the challenges of their future engagement in a professional manner.

I wish to express my sincere thanks and gratitude to Prof. Mohan de Silva for consenting to deliver the Memorial Oration despite of his heavy schedule of work.

May Almighty bless him with peace and prosperity.

Prof. S. Srisatkunarajah

B.Sc.(Hons) Jaffna, PGDE (Merit) OUSL

Ph.D (Heriot-Walt)

Professor in Mathematics

Vice-Chancellor

University of Jaffna

Why do we Fail?

**Dr. M. Ganesaratnam
Memorial Lecture - 2020**

**Prof. Mohan de Silva MS, FRCS Edinburgh, FCSSL
Emeritus Professor Surgery and Consultant Surgeon**

I feel deeply honoured to be invited to deliver the first Dr Mylvaganam Ganesaratnam memorial Lecture in the historic city of Jaffna.

To me, Ganes was a sincere trusted professional colleague. He served as a senior surgeon in the council of the CSSL during my presidency and I served under his leadership in the same council during his tenure of office as the President.

Dr Ganesaratnam was a highly respected surgeon. With his inborn confidence and with high technical competence, he could handle any difficult and challenging surgical encounter in emergency and elective surgery.

Dr Ganesaratnam single handedly served the people of the northern peninsula for well over two decades at a most difficult time in the modern history of Jaffna. Subsequently, he served as the senior consultant surgeon at the National hospital till his retirement.

He was the shining light to thousands of critically injured and ill patients during these exceptionally difficult times, when

they had absolutely no chance of obtaining emergency and elective surgical services anywhere else in the island. While handling a massive work load in the hospital, he also functioned as the Head of the Department of Surgery of the University of Jaffna, performing all teaching and training activities of thousands of undergraduates and many postgraduate surgical trainees, protecting and guiding them at a time when education and training in surgery was not available to northern students. Considering his seniority at the time, he was eligible to the post of consultant surgeon to Colombo General Hospital, as it was called then, a position many surgeons of his vintage was aspiring to, but Ganesh never left Jaffna at this time to serve his people.

Students who learned from this exceptionally gifted surgeon are serving in highly prestigious positions locally and globally, a testimony to his dedication, enthusiasm and unparalleled commitment to work.

Dr Ganesaratnam was a family man, deeply loved and strongly supported by his wife Nirmala and 4 loving children Nishanthi, Ramana, Pavithra and Ranga. When he left peacefully on the 2nd Oct 2017, he would have been in innate peace with himself, considering the number of lives he has saved during his life-time and his massive contribution to mankind.

Unlike many of us who were serving in the rest of the island at the time, Dr Ganesaratnam had to perform services in a very difficult terrain under tremendous pressure and he had mentioned this to me.

Despite this he managed to get most things right and he did not fail. In dedication to the memory of this exceptionally humane surgical giant of our time who dedicated his services to his people at the time of their need, I am extremely pleased to deliver the first memorial lecture to his memory on a very simple topic; and that is, **Why do we Fail?**

Or put it differently, how to get things Right?

What I am about to say is evidence based.

In 1970s two German philosophers, Samuel Gorovitz and Alasdair Macintyre, wrote a short essay on the subject of Human Fallibility. Fallibility means, failure to achieve or incompleteness. What they were trying to find out was, why we fail, on what we set out to do in the world.

One reason they identified was what they called the '**necessary fallibility**', which means that some things we want to do are things that are well beyond our capacity and is simply not possible.

For instance, one may have an exceptional physical ability like Mohamed Ali in boxing, or we may have the state-of-art cutting-edge technology like the ability to land a rover space craft on Mars, but still, there is a limitation to what we can do, beyond which, we cannot achieve and this is what is called the 'necessary fallibility'. For example, Mohamed Ali cannot physically fight with an elephant. We cannot go to another galaxy and return. Things for which we simply do not have the capacity and that is necessary fallibility.

However, there are things within our reach today, which we could not achieve in the past. For example, like treating a heart attack before the heart muscle becomes permanently damaged. In a heart attack what happens is, a blood clot will cut off the blood supply to a part of the heart. If the block is not unblocked within 45 minutes, that part of the heart will undergo permanent damage. When I was a junior doctor, we did not have the knowledge or skills to unblock a block. Today we have both the knowledge and the skills.

We can now build skyscrapers. We can now transplant hearts. Latest of course is that the scientists are now developing a technique called gene editing. From this technology we may soon be able to grow human organs like kidneys which are in high demand for transplantation inside pigs. These are some of the things within our control to-day or going to be within our control in the foreseeable future that we could not do before.

However, when we try to do things within our control, things we have the capacity to do, sometimes still we fail. These two philosophers found that there are two reasons why we fail at doing things that are thought to be within our control.

The first reason is ignorance. In simple the terms, ignorance is, 'partial knowledge'. That is, although we have an understanding of certain things, we do not have a full understanding. This is because modern science has still not given us the complete knowledge of the nature or the human body. For example, we have still not completely understood how to prevent a heart attack. As doctors, we advocate people to lose weight, to

do regular exercises, to avoid stress, not to smoke or drink, have a balanced diet, avoid excessive fat and sugar, and if you are very good and follow all these things which we advocate, some may still develop heart attacks. This means that we still do not know how to completely prevent a heart attack.

All this is because although we have an understanding of these things, we have only got a partial understanding of what we can do.

So, ignorance is one reason why we sometimes fail to do things within our capacity.

The second reason why we fail to do things what we set out to do is, **ineptitude** and this is my topic today.

What does ineptitude mean? What it means is that, we have the full knowledge and skills but there are instances or situations we fail to apply them correctly and as a result we fail.

For example, we have built a building, but the engineers failed to do proper calculations during the design stage and as a result they overlooked some safety principles. The building collapses with loss of life. Or, we have diagnosed a heart attack in a patient, but we were slow to establish our diagnosis and act on it although we are aware that unless we re-establish the blood supply to the blocked part of the heart within 45 minutes that part of the cardiac muscle is going to be permanently damaged. But with all that knowledge we did not achieve the task within 45 minutes and by the time we gave the medicine to dissolve the clot

(streptokinase) or we managed to put a stent to by-pass the block to re-establish the blood supply, that part of the heart has already suffered a permanent damage.

Therefore, the impact of the outcome in these two examples, the collapsing building or permanent damage to heart muscle would have been avoidable, if we did our job with a focused mind and as accurately as possible. So, in these two instances we failed to achieve the best outcome because of our ineptitude.

What about the impact of such poor outcomes? Well, the impact of the poor outcome is high in high-risk environments.

What are the high-risk environments? We the doctors work in high-risk environments such as, operating theatres, Intensive care units, or working in highly infectious environments like during the Covid outbreak. A cockpit of an aircraft, nuclear installations, construction sites, although in a different context, are also in the same league.

As we develop experience and expertise in our professions, we get better in doing things. In our day to-day professional life, because we are good at doing things and because of our experience, we sometimes do things by reflex. We get away because of our experience. That is, most of the time, but may not always.

The point I am trying to emphasize is, irrespective of our experience and expertise, there is a possibility that we may fail

due to our ineptitude because we rely too much on our experiences and expertise without sticking to the basic essentials. In simple terms, we sometimes take short cuts.

I will tell you an interesting story. In 1935, American army considered then as the best in the world, wanted to get better. To achieve the air supremacy, they requested Boeing Company and Martin and Douglas the two big aircraft manufacturers then, to produce a long ranger bomber with certain challenging specifications, which no one else in the world had at the time. The speed, the distance which it can fly, the weight of the bombs it is capable of carrying etc. in one sortie.

Boeing Company responded and produced an aircraft that can fly faster, as twice the distance with the capacity to carry, 5 times the weight of the bombs compared with specifications. As such, there was no competition between Boeing Company and Douglas and Martin. The American Newspapers called it a flying fortress, the Model 299. The Army placed an order for 65 Bombers.

The day of the competition was a mere formality, because there is simply no comparison. The chief pilot was Major Hill, one of the most experienced pilots in the American armed forces then and was their chief trainer. Plane lifted off smoothly, climbed up to 3000 feet, turned on one wing and crashed. Two of the five-crew members including the chief pilot died.

The Army decided to give the contract to Martin and Douglas and Boeing company, nearly went bankrupt.

An Investigation was held to find out why this happened. It revealed that it was not due to a technical fault but due to a pilot error. But Major Hill was their best and the most experienced pilot who had thousands of flying miles to his credit. Of course, this aircraft, substantially more complex than all other aircrafts Major Hill used to fly, the technology was somewhat different. On the other hand, Major Hill was an expert pilot, so experienced that he used to fly with memory. While doing all these, he unfortunately forgot a small but a very basic step, which is to release new locking mechanism on the elevator and rudder control. The outcome was a disaster.

Once the results were released army also purchased few of Boeing aircrafts. A group of test pilots were requested to train pilots. They had a question to answer.

Do the pilots who are going to fly this bomber need a longer training period?

What they decided to do was very interesting. Instead of advocating a longer training program, they recommended something simple. They decided to create a pilot check- list.

You know, taking a plane to air in those days was not complex. You have seen this in films. This is because, the mechanics were not complex; almost taking a car out of a garage. But now they realized that this new machine is substantially more complex cannot be flown by the memory of a one person.

They made this checklist simple. Almost to fit into an index card. Step by step checks; one for take-off, one for flight, one for landing and one for taxiing. These were of course things; every pilot already knew. In their language, simple stuff like; are all the windows and doors closed! But with this checklist in hand, pilots flew Model 299, a total of 1.8 Million miles without an incident.

The American army ultimately ordered almost 13,000 of such aircrafts, which they dubbed as B 17s. This was one of the main reasons why, they had a distinct advantage in the 2nd world war enabling a decisive bombing campaign across Nazi Germany.

What about my specialty Medicine? How complex is it? Ninth Edition of WHO's International Classification of Diseases identifies more than thirteen thousand different diseases.

They have also classified more than 13,000 injury types following major trauma or in critically injured patients.

We have now of more than 13,000 drugs and have the capability to perform 6000 medical and surgical procedures. All these have different requirements, need different skill sets and also the risks inherent to them. Surgeons make decisions every day, whether to carry out an operation or refrain from doing it. We balance the risks inherent to the procedure and the benefits.

So, it is more complex than flying, taking off, landing and taxiing. There is a lot to get right. If we cannot get right, the most disastrous outcome may be death.

To highlight the magnitude of the complexity, I will tell you about an interesting research study done by Israeli scientists. The study-involved engineers observing the care of Intensive care unit patients for 24-hour periods. They found that, on an average, an ICU patient required 178 individual actions per day such as administering a drug, suctioning the lung, making a decision to change the rate of ventilation etc. Every action, if not done properly had a risk to the patient. They also recorded the errors and found that on average, there were two errors per day, per patient. We all know that intensive care succeeds when the chance of causing harm is kept at a minimum.

So how can we perform such actions or decisions more effectively? Would the checklist approach work? It was difficult to imagine. Is medicine too complex for checklists because there are too many variables? So much so that some of the complications that occurred in ICU settings were once regarded as routine. A classic one was infection that occurs in lines or tubes we inset to patients. These are called central lines for nurses and doctors to give drugs and nutrition to ill patients.

Data from USA shows than an average of 5 million lines are inserted per year and 5-28% of such line infections ends up in deaths.

In 2001, critical care specialist Peter Pronovest gave a try to reduce line infections. He created a checklist. Simple items, but with an important difference. The difference is that, he managed to obtain mandate from the hospital administration to give power to nurses to make sure that doctors carry out this simple checklist accurately. These are nothing new.

1. Did the clinician washed the hand with soap and water?
2. Was the patient's skin toughly cleaned with an antiseptic?
3. Was the entire patient covered with sterile cloths like in an operation theatre?
4. Was the clinician wearing a mask, sterile gown and sterile gloves?
5. Was a sterile dressing placed over the site after inserting the line?

What was the result? In John Hopkins Hospital where this research was carried out, 10-day line infection rate at the time was 11%.

The results of the study surprised the doctors and administrators. When this simple check list was rigidly executed, the 10-day line infection rate came down from 11% to 0%. This was an eye opener.

We have identified that, what was thought as a routine complication was in fact a preventable complication. This stimulated clinicians to think further and do more research.

In 1999, Institute of Medicine in USA in a sentinel study showed that 40,000 to 98,000 deaths in one year that have occurred in American hospitals were preventable; that is, these patients have died due to medical errors. Obviously, the impact of the result shook the medical world. The same study in 2013 showed that 440,000 preventable hospital deaths each year in the USA, 4.5 times higher than the 1999 estimate. There was a high-profile case where by mistake, the wrong kidney was removed in a patient who had only one functioning kidney at the time.

Medical Errors have now become the third commonest cause of death in USA, only behind Heart attacks and Cancer. We do not have such accurate data in Sri Lanka.

Responding to the global problem of safe surgical care, WHO in 1998 appointed a team of experts led by Atul Gawande of Harvard University to study the issue of surgical safety. Prof. Gawande is a general surgeon with a special interest in trauma and cancer surgery who has written on this subject extensively. I acknowledge that, most of the material in this lecture also has been extracted from his writings. The team identified three major areas to address to improve the surgical safety. These involved people, who are actively involved in surgical care, that is surgeons and anaesthetists and the third; the essential basics that can be improved.

The recommendation was to develop
Safe Anesthetic Teams,
Safe Surgical Teams
and
to prevent Surgical Site Infections.

For this purpose, they designed a 19-item checklist to be completed in three stages.

1. before we put the patient to sleep
2. before we start the operation
and
3. After completing the operation but before patient leaves the operating theatre.

They conducted a pilot study first in eight hospitals, four from high income and four from mid and low-income countries. They used five parameters to assess improvement in outcomes.

These parameters were simple

1. Was there any wound infection?
2. Was there any complications?
3. Did the patient develop Pneumonia?
4. Did the patient had to be taken back to operation
and
5. Did the patient die?

A statistically significant improvement was noted in all 5 measures.

Therefore, in 2008 the WHO Surgical Safety Checklist was released globally. Two new carefully controlled studies tested the checklist again, and both confirmed that surgical checklist can achieve significant reductions in complications and death. We introduced the checklist concept to Sri Lankan operating theatres in 2012.

So that is the story of checklists. How checklist approach has helped to enhance outcomes in this complex world, especially to those of us, me and you who work in high-risk environments. The importance of checklists to get things right in what we do.

Finally, as we all know, during last few decades, with the advent of minimal access surgery, there has been an unparallel

technological development in the field of surgery. Surgeons are continuously under pressure to learn new techniques. However, when learning and adopting new techniques, it is not possible to avoid a learning curve. Therefore, to balance the learning curve without compromising patient safety continues to be a challenge.

Of course, our patients would like us to develop our expertise but, they do not want us to take risks with their lives. If I am allowed to quote one British public report, which says that *there should be no learning curve as far as the patient safety is concerned*. But on the other hand, at a time, the pace of medical innovation is advancing so rapidly, surgeons have little choice but to learn new things and therefore the learning curve is extremely useful both during training and for practicing surgeons. This is inescapable for progress.

I wish to tell you about an interesting research study regarding learning curves. This is my last story!

In 2002, a group of Harvard Business School researchers, who have made a specialty of studying learning curves in industry like learning curves in building planes decided to examine learning curves among surgeons. They followed 18 cardiac surgeons as they took on a new technique then, the minimally invasive cardiac surgery. This then was a first of its kind. As learning is ubiquitous in medicine no one has ever compared how well different surgeons actually do it.

To make it simple for some of you, minimally invasive cardiac surgery involves approaching the heart through small

holes in the rib cage without splitting open the chest wall in the centre. While cardiac surgery of this nature being performed, blood needs to be re-routed through the heart by-pass machine and they have to devise and learn new methods to reroute blood involving balloons and catheters via the groin vessels. And also, they had to learn to operate in a much-reduced space. Not only the surgeons and assisting surgeons but all in the team; the nurses, perfusionists, anesthesiologists, all of them had new roles, new tasks, new instruments and new techniques to learn. They have to witness new complications and find new ways to sort the problems. A substantial learning curve, in-deed. A fully proficient team takes three to six hours during the learning curve and teams took as much as three times longer for their early cases.

But what is most interesting was that the researchers found remarkable differences in the speed with which different teams learned. For the training programme, all teams came from respectable institutions with experience in adopting for new innovations and all had same three-day training session.

Yet, during the performance of first 50 cases, some teams managed to half the operating time while others failed to improve at all. It therefore appeared that practice did not necessarily make perfect. When it did, the researchers found that it depended on how surgeons practiced.

There was one physician amongst the Harvard researchers. He made several visits to observe one of the quickest learning teams and one of the slowest learning teams and he was startled by the contrast.

Surgeon on the fast learning team was quite inexperienced compared with the one in the slowest learning team. However, he had picked up a team with whom he had worked well before and kept the same team together through the first 15 cases and did not take any new members to the team. He had the team go through a dry run before the first case and deliberately scheduled the first six cases in the first week. He convened the team before each case to discuss in detail and debriefed after each case. Researcher noticed that as a person, this surgeon was not the one like a 'Napoleon with knife in his hand type'. He was a team person and allowed himself to be a partner with the rest of the team. The other surgeon, the experienced one chose his team randomly, did not keep them together even for the first seven cases, the team had different members every time; no pre briefings or debriefings and no tracking of ongoing results.

This study offers some valuable information and conclusions useful to all of us; not only to surgeons. It shows that we can do things that can have dramatic effect on the learning curve by being more cautious on how we train, how we track our progress and how we could enhance our outcomes by attention to detail irrespective of the nature or complexity of the procedures we do.

Also, this study has shown that no matter how accomplished we are, when we try something new, we will get worse before we get better and the learning curve proved longer and affected by a far more complicated range of factors than what any one has realized.

Performing safely during the learning curve is the challenge.

Therefore, to fulfill the expectations of the patients we serve, when making balanced decisions which has implications on their lives, it is paramount that we reflect on all relevant aspects most carefully by sticking to basics, using checklists, to be focused and attentive at all times when making decisions, before, during, and after surgery and when handling complications. We must always learn to work in teams, respect opinions of other members and share all such information as clearly as possible with all stakeholders, especially the patient and the family and finally, learn to do one thing at a time.

Ladies and Gentlemen

Medicine has evolved and today, patient safety overrides all other concerns. In anything we do, it is the final physical and emotional outcome to the patient that matters. Therefore, as doctors we must never display ineptitude.

Dr Ganesaratnam during his long career too faced all such challenges and served to the best of his ability, saving lives.

May his soul attain Moksha

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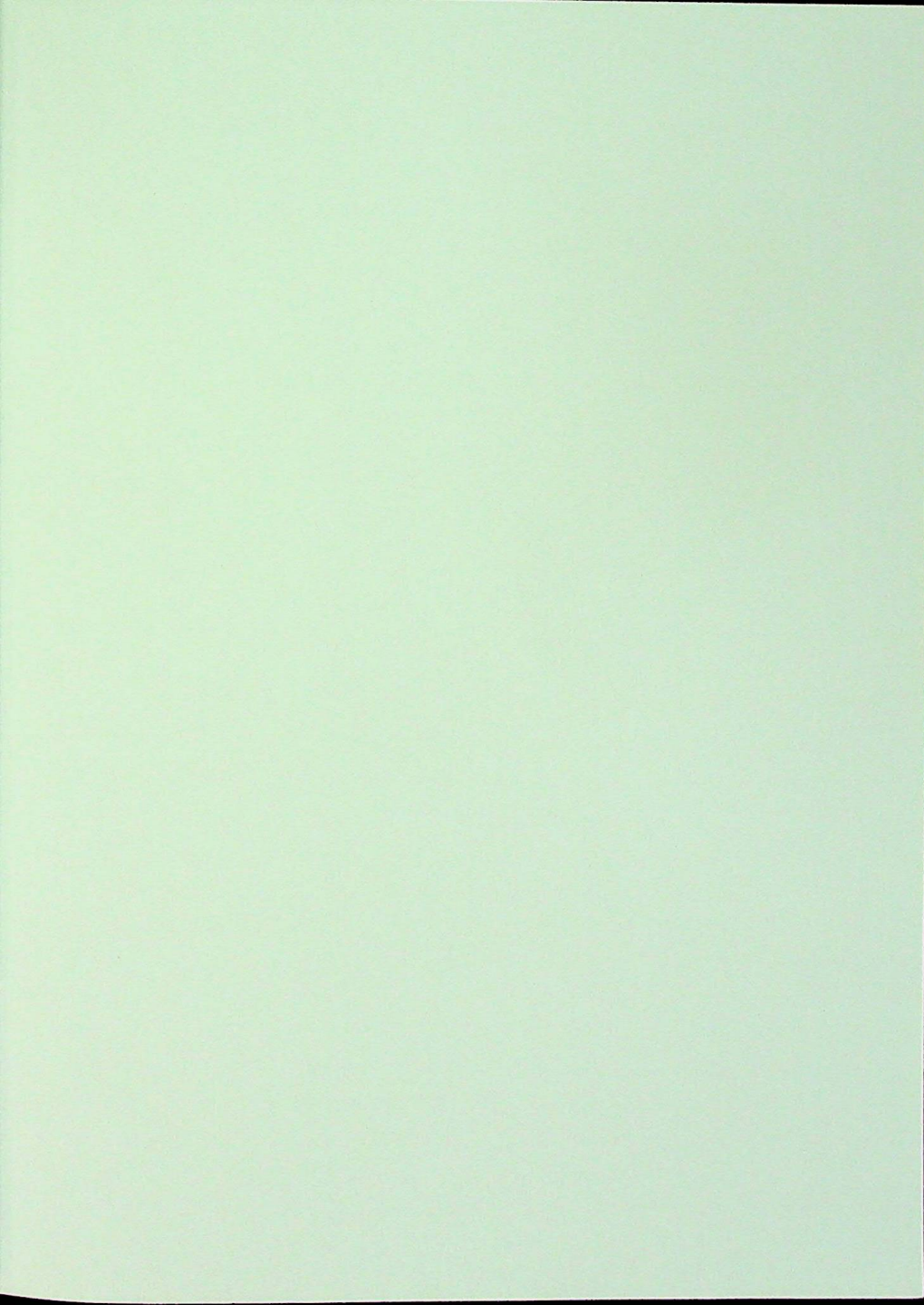
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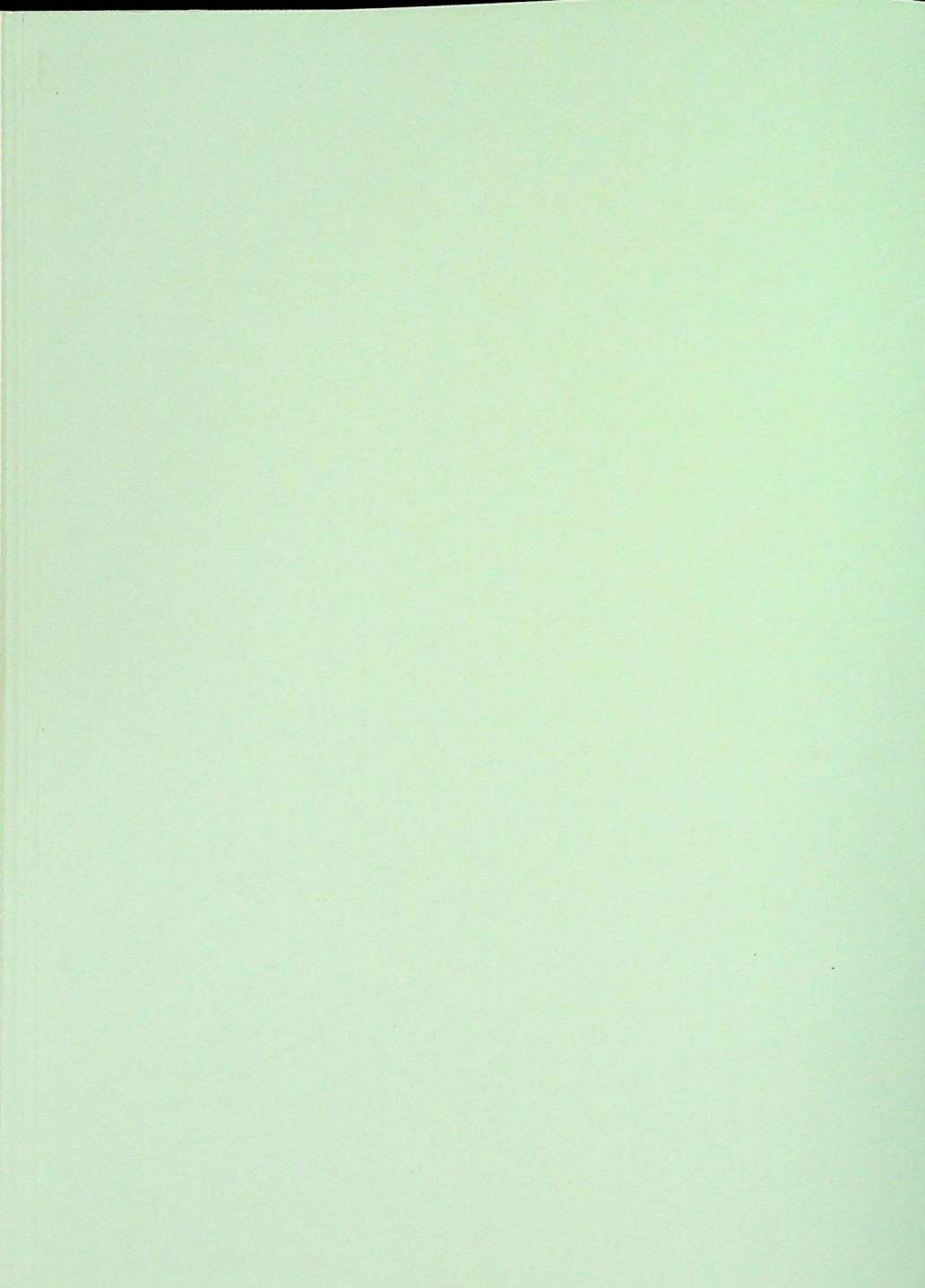
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Prof. Mohan de Silva is one of the leading Surgeons in the Country. He has been an excellent teacher in Faculty of Medical Sciences, and published several research publications and books in Surgery.

After completing earlier education at St. Thomas' College Gurutalawa, he moved to Nalanda College Colombo for secondary education and after being a brilliant student at

Nalanda, he entered the University of Ceylon's, Colombo Medical Faculty in early 1970s to be graduated as a Medical Doctor. While at school Prof. Mohan played for the Nalanda College first XI cricket team as an all-rounder and a fine right arm leg-spinner and also played basket-ball.

Professor Mohan De Silva also captained the University of Ceylon cricket team in the Sara Trophy Tournament, whilst being a medical student, in the 1970s. He was also a pioneer in organizing the Inter-University Medical Faculty Cricket Tournament in Sri Lanka and he had played many cricket matches with the students, inter faculty, inter university and with the Colombo south Hospital staff. He is a talented singer who had performed in many 'Talents' shows and other musical events at the university.

Prof. Mohan de Silva joined the Faculty of Medical Sciences as Senior Lecturer in Surgery in 1996 as one of the very initial clinical teachers. He played a key role in setting up the Professorial Surgery Unit at Colombo South Teaching Hospital and getting all the instruments to the unit and developing it as one of the best endoscopic units in Sri Lanka. He is a very skilled surgeon and he has trained many surgeons under his guidance.

He is a very dedicated teacher who can impart subject knowledge to his students in a very simple way. He is an author who has written several books and making the subject surgery very easy to understand. Not only surgery he had taught Anatomy in the dissecting room on so many occasions. He is a researcher who has published in reputed journals.

He was elected as Dean of Faculty of Medical Sciences, University of Sri Jayawardenepura in January 2011 and continued until December 2014.

He was also the 22nd President of the College of Surgeons of Sri Lanka. Professor de Silva also served as the Chairman of University Grants Commission since March 2015 and he retired from university services on 8th August 2018.