Sickle Cell Crisis Prevention and treatment in the golden half hour

- by Sota Omoigui MD
- Discoverer – The first solution in 7300 years

Let oxygen be your medicine

- Email: Medicinechief@aol.com
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The sun has risen after 7300 years of darkness

The first discovery in 7300 years – Let oxygen be your medicine

- The first discovery in 7300 years for the prevention and stopping of sickle cell crisis in the golden half hour.

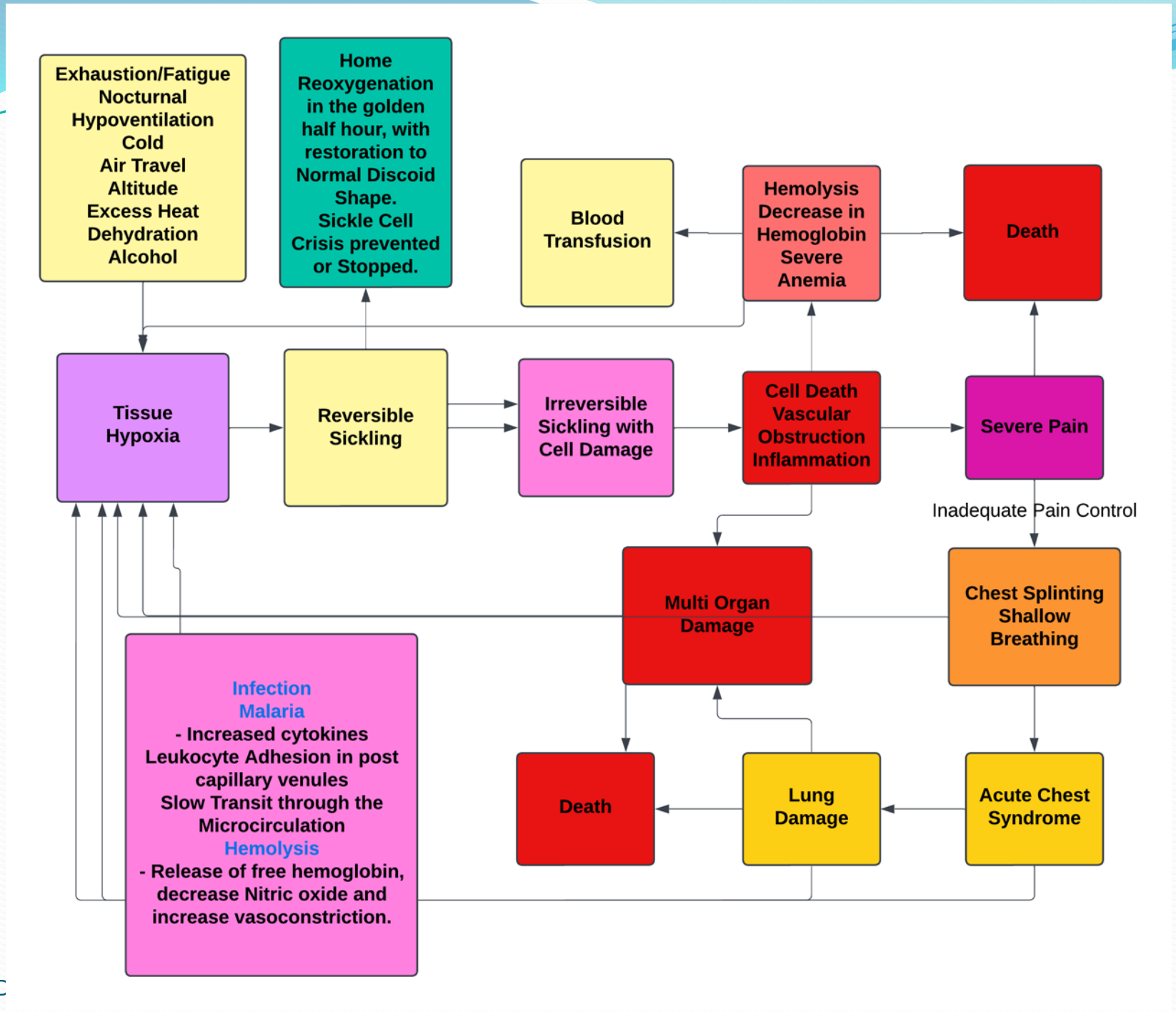
Play video here

- https://youtu.be/HM0b49txX4Q

- **Sickle Cell Disease**

Underlying Pathology

- Sickle Hemoglobin has a low tolerance to hypoxia (low oxygen environment
- Hypoxia (or low oxygen environment) induces polymerization (sickling)
- Initially, a reversible Sickling that in the absence of oxygen can progress to Irreversible Sickling (cell damage and death)


Exhaustion/Fatigue
Nocturnal
Hypoventilation
Cold
Air Travel
Altitude
Excess Heat
Dehydration
Alcohol
Home Reoxygenation in the golden half hour, with restoration to Normal Discoid Shape. Sickle Cell Crisis prevented or Stopped.
Blood Transfusion
Hemolysis Decrease in Hemoglobin Severe Anemia
Death
Tissue Hypoxia
Reversible Sickling
Irreversible Sickling with Cell Damage
Cell Death Vascular Obstruction Inflammation
Severe Pain
Inadequate Pain Control
Multi Organ Damage
Chest Splinting Shallow Breathing
Infection
Malaria
- Increased cytokines Leukocyte Adhesion in post capillary venules
Slow Transit through the Microcirculation
Hemolysis
- Release of free hemoglobin, decrease Nitric oxide and increase vasoconstriction.
Death
Lung Damage
Acute Chest Syndrome

100 years of research

- Initial Hemoglobin S sickling is reversible with re-oxygenation within the first golden half hour (30 mins).
- When time progresses the cells become irreversibly sickled. Irreversibly sickled cells (ISC's) are circulating blood cells in patients with sickle cell disease that retain a sickled shape and do not respond when oxygenated.
- Irreversible sickle cell formation is time dependent and the cell membranes are damaged, they die, create an inflammatory reaction and obstruct blood flow causing severe pain and organ damage

Reversible sickle cells and Reoxygenation
Predicting behavior of sickle cells

- Play Video Here

- https://youtu.be/HM0b49txX4Q

History

- 1910, Sickle cell disease was first described by Herrick
- 1927, Hahn and Gillespie suggested that hypoxia or a low oxygen environment caused the sickling of red blood cells
- 1930, Scriver and Waugh in Canada reported that the number of sickle cells in the blood may be varied by the change of the partial oxygen (O2) pressure; that this is a reversible reaction

History

- 1983, Franck and Chiu stated that deoxygenated *reversible sickle cells (RSCs) possess the ability to readopt their normal discoid shape upon reoxygenation*

- In 1991, Robert Hebbel stated that Phospholipid (PL) can traffic between monolayers of the cell membrane. Deoxygenation-induced sickling causes an alteration of PL organization, and take the form of enhanced transbilayer mobility and/or an actual, stable loss of asymmetry.

- *For reversibly sickled cells this destabilization is reversible, with reoxygenation allowing a return to normal Phosphatidylcholine (PC) translocation rates and near-normal Phosphatidylserine (PS) availability to phospholipase.*

History

- 2015, Melanie Gonick, Predicting behavior of sickle cells. Massachusetts Institute of Technology (MIT),

Reversible sickle cells and Reoxygenation

Play Video here

- *https://www.youtube.com/watch?v=hrD6xZ5lzYM*

Clinical Trial

- August 1992, Zipursky et al in Toronto, Canada: the effect of oxygen therapy on the number of irreversibly (ISC) and reversibly (RSC) sickled cells in patients with sickle cell anemia

- Inhalation of 50% oxygen in patients who were not in crisis produced a significant fall in RSCs and a lesser fall in ISCs. Inhalation of 50% oxygen in patients who were in crisis, showed a significant reduction in RSCs, but not in ISCs. In the group of patients that receive air (no supplemental oxygen) there was no significant change in RSCs or ISCs.

Clinical Trial

- In patients that were already in a crisis, despite the reduction in RSCs in the oxygen-treated group, there was no significant difference between the air and oxygen groups in the duration of severe pain, opioid administration, and hospitalization.

- As mentioned before, oxygen therapy when a sickle cell crisis is already established, does not affect the population of ISC as those have to be cleared by destruction - hemolysis, phagocytosis or sequestration.
- And is the cause of a drop in hemoglobin and severe anemia

Clinical Summary

- Reversible sickle cells (RSC) can become irreversible sickle cells (ISC) with cell membrane damage and cell death after repeated episodes of sickling.

- Reversible sickle cells revert to their original flexible discoid shape when reoxygenated, but repeated sickling damages the cell membrane and make it impossible for the cells to return to their normal shape, becoming irreversible sickle cells and subsequent cell death.

Clinical Application

- Sota Omoigui, 2024 - Oxygen therapy in the golden half hour (30 minutes) onset of a crisis restores reversible sickle cells and prevents them from progressing to a critical mass of irreversible sickle cells, wherein the sickle cell crisis becomes established and intractable

- If we can reverse the low oxygen environment, by providing home inhalation oxygen within the first 30 minutes of a sickle cell crisis, we can stop the crisis. And when you stop the crisis, you prevent the severe pain, hospitalization and multi organ damage

Why did we miss this solution?

- Because, by the time these patients seek medical care or arrive in the hospital, they are already experiencing irreversible sickling which can no longer be reversed by oxygenation.

- Time dependent golden half hour intervention for a sickle cell crisis, similar to that of the golden hour for stroke when there is the best chance of restoring blood flow and saving brain tissue or that for myocardial infarction wherein timely intervention impacts a patient's survival and quality of life following a heart attack

Sota Omoigui MD - Clinical Practice

- In the last 20 years, we have been able to reduce the incidence of sickle cell crisis as well as reduce hospitalizations by 90%.

- The sickle cell crisis results in obstruction of blood flow, severe pain and suffering and damage to organs. It results in severe life threatening and disabling complications including acute chest syndrome, avascular necrosis of the hips (death of bone tissue due to lack of blood supply) with bone destruction, stroke, brain damage, priapism, kidney damage that may result in dialysis and increased risk of death.

- The key to the disease is preventing or stopping the crisis, at the first sign of the crisis.

Prevention

- When and where do the majority of crisis occur?

- A low oxygen environment due to nocturnal hypoventilation (shallow breathing, nasal vascular congestion reducing airflow in the supine position), during sleep whether at bedtime or in the daytime.

- Patients with sickle cell disease are fearful of going to sleep.
- 2003, Hargrave et al concluded that low nighttime oxygen saturation was highly significantly associated with a higher rate of painful crisis in childhood.

Prevention

- 2024, Chang et al - 43% of sickle cell patients that they studied, had sufficient nocturnal hypoxemia to warrant oxygen therapy.

- They concluded that oxygen therapy may decrease inflammation and oxidative damage in hypoxic individuals.

Aggravating Factors

- A low oxygen environment is made worse when there are one or more triggers such as increased anemia, pain, stress, fatigue, exertion/exhaustion, infection, increased sedation, alcohol ingestion, altitude (>2000 ft), infection, cold environment, a feeling of being unwell etc.
- In the absence of triggers, patients with sickle cell disease do not have to sleep with oxygen
- Should the patient wake up in a crisis, they should immediately turn on their oxygen cylinder or machine and apply oxygen (within the golden half hour) to abort the crisis

Prevention

- When there is any stressor during the day, as listed below, the person should sleep with oxygen. Sleep is the most dangerous time as the low oxygen environment will tip the person into a crisis:

- Physical stress: e.g. from physical activity
- Intellectual stress e.g. preparing for exams, writing papers
- Environmental stress e.g. cold environment, high altitude, air travel

Prevention and Treatment

- Physiological stress e.g. during sleep, excess heat, dehydration, pain, emotional stress, infection, malaria, pneumonia.
  - Note: Infection, malaria and pneumonia also need to be prevented and timely treated. Otherwise there will be more reversible sickle cells than oxygen can restore.
- Treatment: use oxygen within the golden half hour of onset of symptoms, to stop a crisis.

Proof of Concept

- Disease burden of sickle cell anemia has improved with the advent of medications like hydroxyurea and Voxelotor.
- These medications target the availability of oxygen at the molecular level to the sickle hemoglobin.
- Once again, we mention oxygen. Hydroxyurea increases Hemoglobin F (HbF) production in RBCs and decreases sickling of HbS

Proof of Concept

- Hb F evolved to potentiate the transfer of oxygen (O_2) from a mother's blood to fetal tissues, a goal achieved by the higher Oxygen affinity of Hb F compared with adult Hb A.

- Oxbryta (Voxelotor) increases the affinity of the sickle hemoglobin for oxygen, thereby inhibiting sickling, reducing the amount of hemolysis and increasing hemoglobin levels

Proof of Concept

- Oxbryta taken orally (at 500 mg, three tablets once daily) can raise the hemoglobin level of a person with sickle cell anemia, by 2-3 g/l (Hematocrit increase of 6-9 %), within just a few days and in some cases can return close to normal levels - almost as fast as a blood transfusion, and without the possible complications

Negative Proof of Concept

- The Novartis $665 million drug, Crizanlizumab-tmca (Adakveo), a humanized monoclonal antibody against P-selectin which inhibits the adhesion of sickle erythrocytes and leukocytes to the endothelium.
- Crizanlizumab was approved by the FDA in November 2019 for reduction in frequency of vaso-occlusive crises.
- In May 2023, The European Medicines Agency's (EMA's) Committee for Medicinal Products for Human Use (CHMP) revoked Novartis' approval for Adakveo after concluding that the med's benefits did not outweigh the risks. In the global phase III study STAND (NCT03814746) trial, the drug didn't outperform placebo.
- Specifically, Adakveo (crizanlizumab) couldn't reduce the number of painful crises leading to a healthcare visit. Adakveo-treated patients saw an average of 2.5 painful crises more than patients in the placebo group who had an average of 2.3. The average number of crises requiring treatment was 4.7 in the Adakveo group compared with placebo's 3.9.
- On January 10th, 2024, the UK Medicines and Healthcare products Regulatory Agency (MHRA), based on the same Phase III STAND study, revoked a conditional marketing authorization for Adakveo to treat sickle cell disease.

Air Travel and High Altitudes

- Air travel is a hidden danger for sickle cell patients. During and following commercial airline flights, patients with sickle cell disease are known to experience complications such as bone pain, splenic infarction, osteonecrosis (avascular necrosis) of the hip, and, in some cases, prolonged crisis resulting in death.
- These complications have been linked to prolonged oxygen desaturation at high altitudes, with oxygen saturations measured as low as 77%, instead of the normal of 95%-100%. Desaturation begins within 10 mins of the aircraft taking off.

Treatment of a Crisis

- Time is of essence to abort the crisis within 30 minutes before severe pain produces chest splinting, inadequate respiration, further hypoxic sickling and a prolonged crisis requiring hospitalization.
- The patient's physician or hospital should have a standing order for the Emergency Medical Service (EMS) ambulance team or a home health nurse to administer at home, the first dose of opioid and anti-inflammatory injections that the patient has previously tolerated, together with oxygen, pulse oximetry and vital sign monitoring. Only strong injectable opioids (e.g. Morphine, Pethidine, Hydromorphone, Fentanyl , Ketamine injection) combined with injectable NSAIDs (e.g. Ketorolac, Diclofenac injection) that the patient has previously tolerated in a hospital setting, should be used. Weak opioids like Pentazocine or Tramadol are ineffective and will only prolong a crisis.
- Where available, patients are advised to call an ambulance and proceed to the hospital should oxygen fail to abort the crisis, because severe anemia and infection including malaria, pneumonia may be the cause of the crisis.

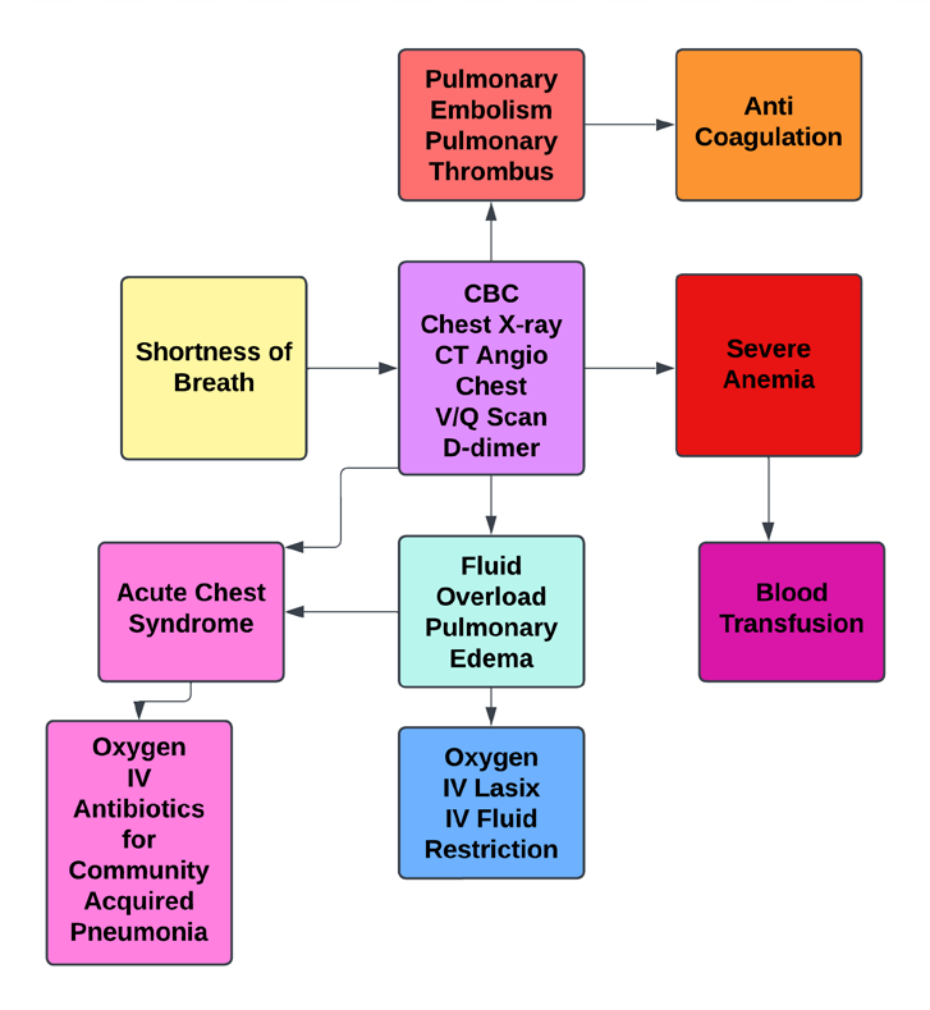
Therapy Complications - Fluid Overload

- Gaartman et al 2021: Intravenous fluid therapy (IV -FT) is routinely used in the treatment of vaso -occlusive crises (VOCs)
- Sickle cell disease is complicated by diastolic dysfunction and pulmonary hypertension, which in combination with the large amounts of IV and oral fluids may increase the risk of fluid overload with pulmonary edema in patients with SCD.
- Blood transfusions, are an independent risk factor for fluid overload
- Pulmonary edema, in turn, can lead to an increased risk of acute chest syndrome (ACS), a potentially fatal complication of SCD.

Therapy Complications - Fluid Overload

- Hypoxia and shortness of breath due to fluid overload can also be mistaken for ACS, resulting in improper treatment with antibiotics and/or blood transfusion.
- Fluid overload occurred in 21% of 100 patients. Hospital stay was longer in patients with fluid overload (6·0 vs. 4·0 days, $P = 0{\cdot}037$).
- An autopsy study in 21 patients who were hospitalized for VOC and died unexpectedly found that 15 patients had some form of lung pathology and seven (47%) of these 15 patients had pulmonary edema, probably due to fluid overload

Shortness of Breath during Admission



Sota Omoigui MD - Case Presentation

- Seven patients with sickle cell anemia over the last 20 years. Their ages range from 25 to 67 years. They were all African American with five males and two females. Pain crisis with excruciating pain scores of 10/10 occurred on average once every 2 months with hospitalizations about once every 3-6 months. All of our patients had the majority of their crises occurring at night, waking them up from sleep or occurring after they took plane flights or visited cities at high altitudes such as Denver Colorado or Las Vegas, Nevada.

- Our patients are prescribed an oxygen concentrator to use at home. They are advised to sleep with oxygen (1.5-2 liters /min by nasal canula) only when there are one or more triggers such as increased anemia, stress, exertion/exhaustion, infection, increased sedation, alcohol ingestion, altitude (>2000ft), infection, cold environment, a feeling of being unwell etc. In the absence of triggers, they do not have to sleep with oxygen.

- All of our patients were able to abort a crisis by administering oxygen at the first sign of the crisis. The only exceptions were when the crisis occurred outside the home or was induced by infection or hypothermia.

Sota Omoigui MD - Case Presentation

- Before our intervention, with provision of an oxygen concentrator for administration of oxygen before sleep, they had sickle cell crisis, on average one every two months, with hospitalizations about once every 3-6 months, despite being on hydroxyurea.
- During these crises, they experienced disabling pain scores of 10/10, requiring prolonged hospital admissions ranging from 3 days to 3 weeks. The prolonged hospital stays occurred with development of acute chest syndrome or other complications.
- After implementation of night time inhalational oxygen, pain crisis reduced in frequency to once every 6 months to 1 year. Hospitalizations were reduced from once every 3-6 months to once every 3-5 years. Most of those few and far between hospitalizations were due to cold or infection.

Cost of Crisis

- 2021 Study by Holdford et al showed:
  - $1.5 billion in lost wages and productivity each year in the USA
  - $650,000.00 lost over the average working life of a person with sickle cell disease
- 2019 Study by Fingar et al - In 2016, aggregate costs for inpatient stays for SCD totaled $811.4 million with an average length of stay of 5 days.
- 2013 Lanzkron et al - Average Life expectancy in 2005 was 42 years for females and 38 years for males

US Agency for Heathcare Research

- In 2016, there were 134,000 sickle cell disease (SCD)-related inpatient hospital stays. Over three-fourths of these stays involved a pain crisis.
- Half of all SCD-related stays were for patients 18–34 years old, and nearly 90 percent were for Black patients.
- Nearly all stays with a principal diagnosis of SCD involved a pain crisis (96.0 percent).
- Nearly 90 percent of stays involving SCD were for Black patients.

Cure

- Several curative options for sickle cell disease. The essence of these cures is to reduce sickle hemoglobin and provide increased oxygen capacity of the replacement hemoglobin. Adding to Bone Marrow Transplantation, two gene therapies LYFGENIA™ (lovotibeglogene autotemcel), also known as lovo-cel and CASGEVY (exagamglogene autotemcel) have recently been approved

- Casgevy and Lyfgenia, cost $2.2 million and $3.1 million per patient, respectively for a course of treatment, which can take up to a year.

Cure

- The gene therapies require several other procedures — including chemotherapy prior to the treatments, which involve removing blood cells from a patient and modifying the DNA before re-introducing them in the body.
- Costs and availability will limit their global application, even in high-income countries. Capacity is limited. Bluebird Bio, the company that makes Lyfgenia, estimates that it can treat 85–105 patients per year in the USA with the gene therapy. The process is complex and time-consuming, and medical centers can only handle a limited number of patients because each person needs intensive care

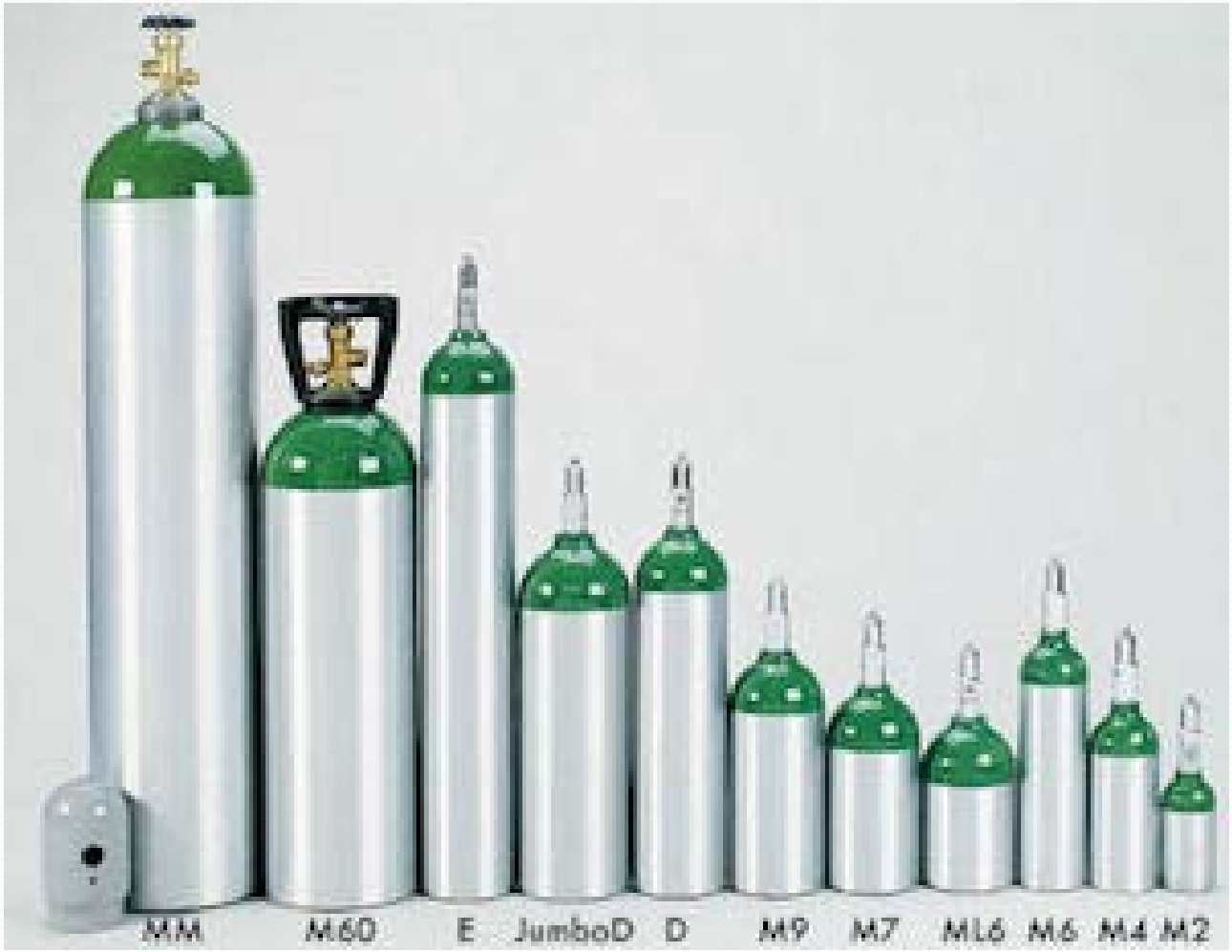
Cost

- Oxygen Cylinder – N150,000 one time ($ 85.00)
- Oxygen refills – N30,000 every 3-4 months, or $1.00 per week.
- Oxygen Concentrator – N650,000.00 ($400.00) for low cost models lasting 3-4 years, or $2.00 per week
- Oxygen is the cheapest, most affordable treatment compared to any medication for a chronic illness

Oxygen Concentrator Specifications

- Continuous Flow. Pulse dose not effective.
- At least 1.5-2 liters per minute
- At least 90% + or - 3% purity across all flow rates. Avoid concentrators with low quality sieve beds that have decreased oxygen purity with higher flow rates.
- Rechargeable battery – For those in Nigeria and the Global South due to erratic power supply

Oxygen Cylinders



Home Oxygen Concentrator

Oxygen Concentrator – FAA Approved for Aircraft

Conclusion

- Studies have shown that there are no deleterious effects from long term use of oxygen

- 2021 Liguoro I, et al. concluded that long-term oxygen therapy (LTOT) administered from 2014 to 2019 was a safe and feasible treatment option for children (age range 6-15) with SCD and chronic hypoxaemia.

Conclusion

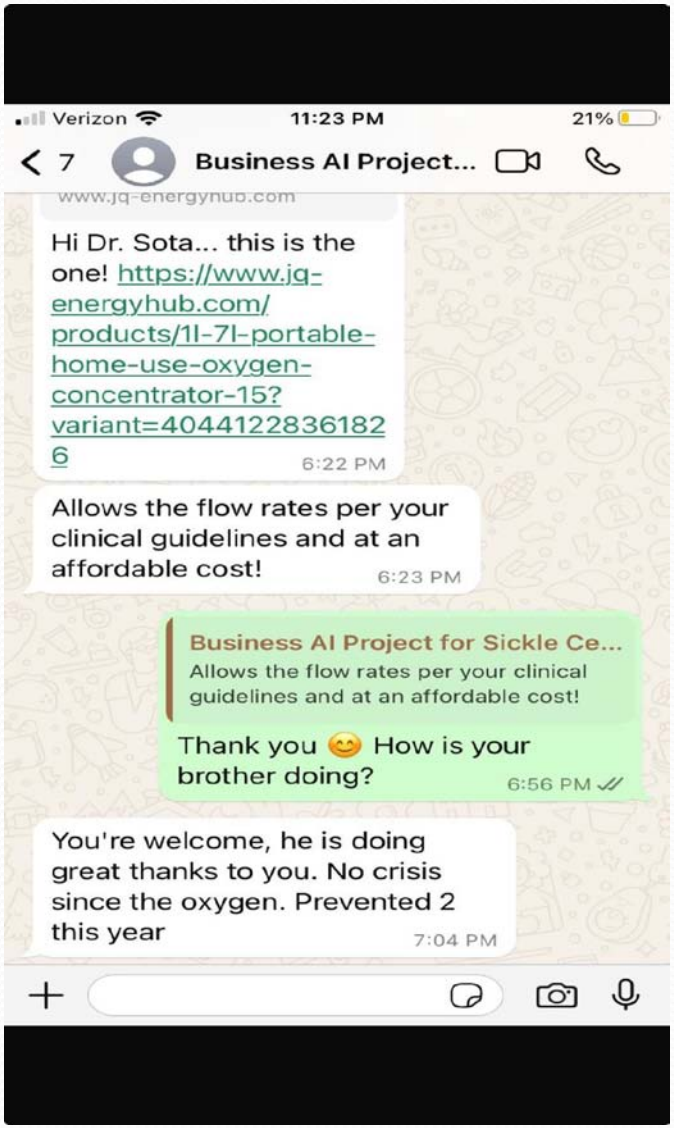
- Intervention with home inhalational oxygen that can prevent and in the golden half hour abort a sickle cell crisis, must be made available and accessible, to the estimated global population of 7.74 - 20 million patients with sickle cell disease, and a sickle cell disease mortality burden at 376 000 in the year 2021

Conclusion

- As Hippocrates stated in 400 BC, let food be your medicine,

- Sota Omoigui declares in 2024 AD, that the guiding principles in the management of sickle cell disease shall be: Let Oxygen be your medicine

Patient's sister Communication



Patient father's Communication

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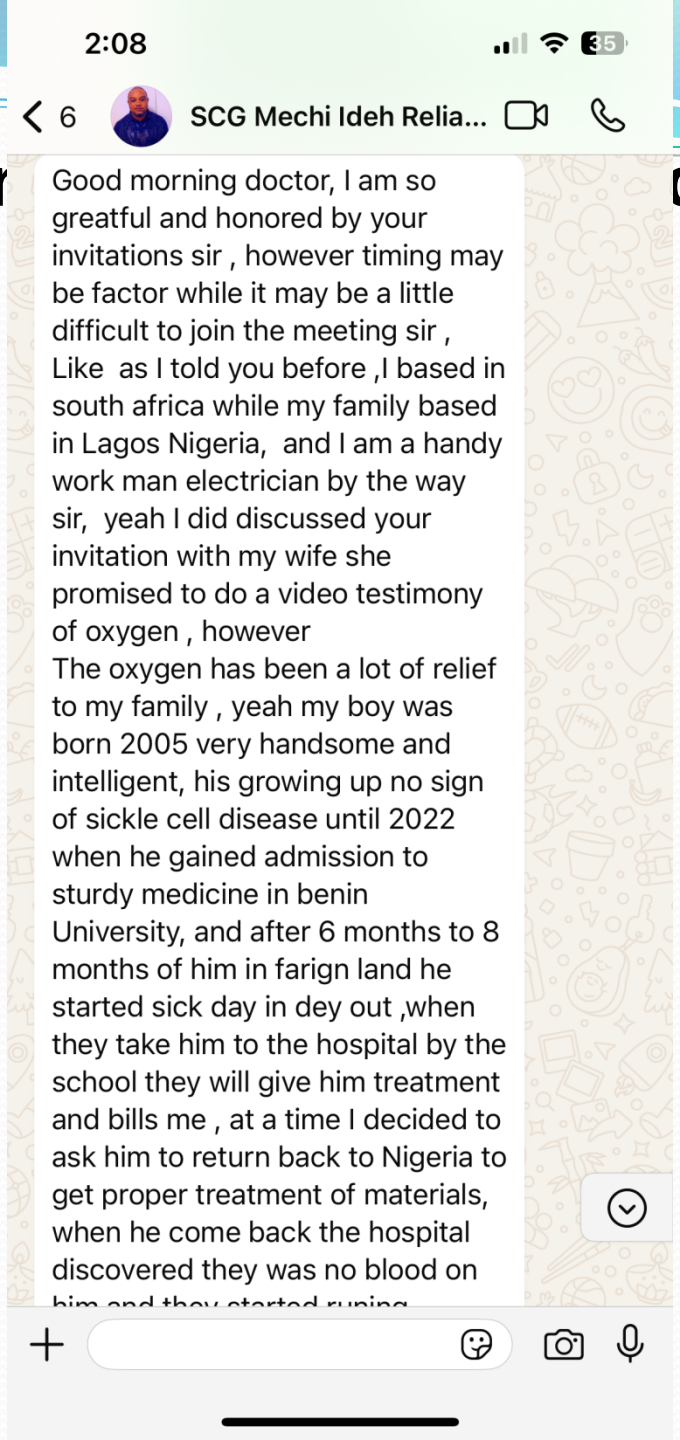

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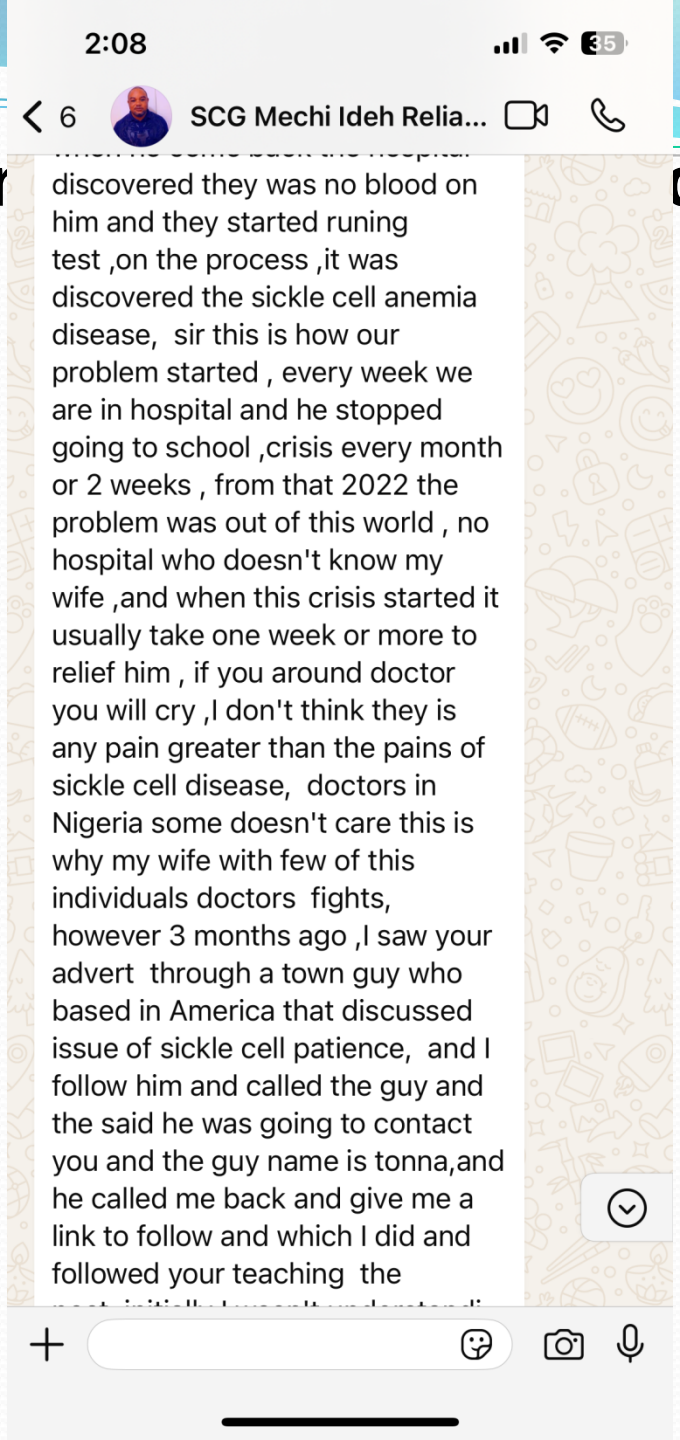

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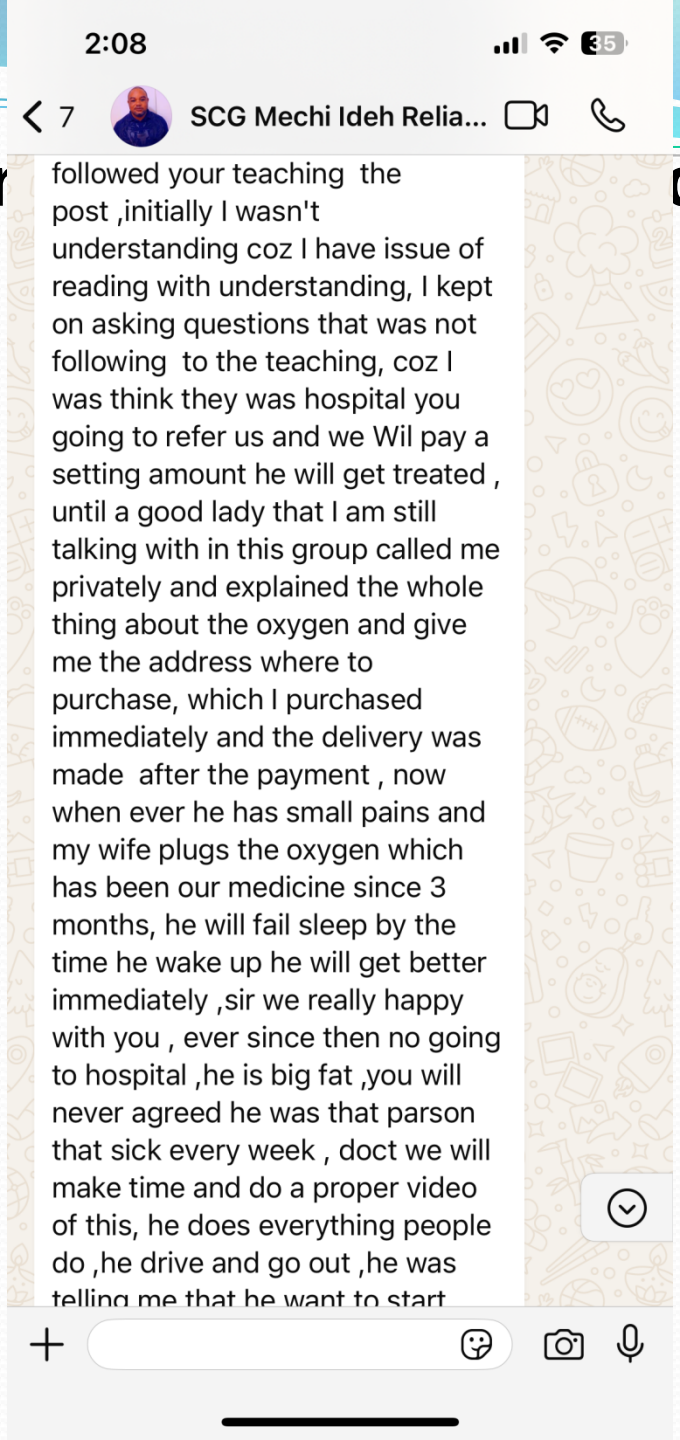

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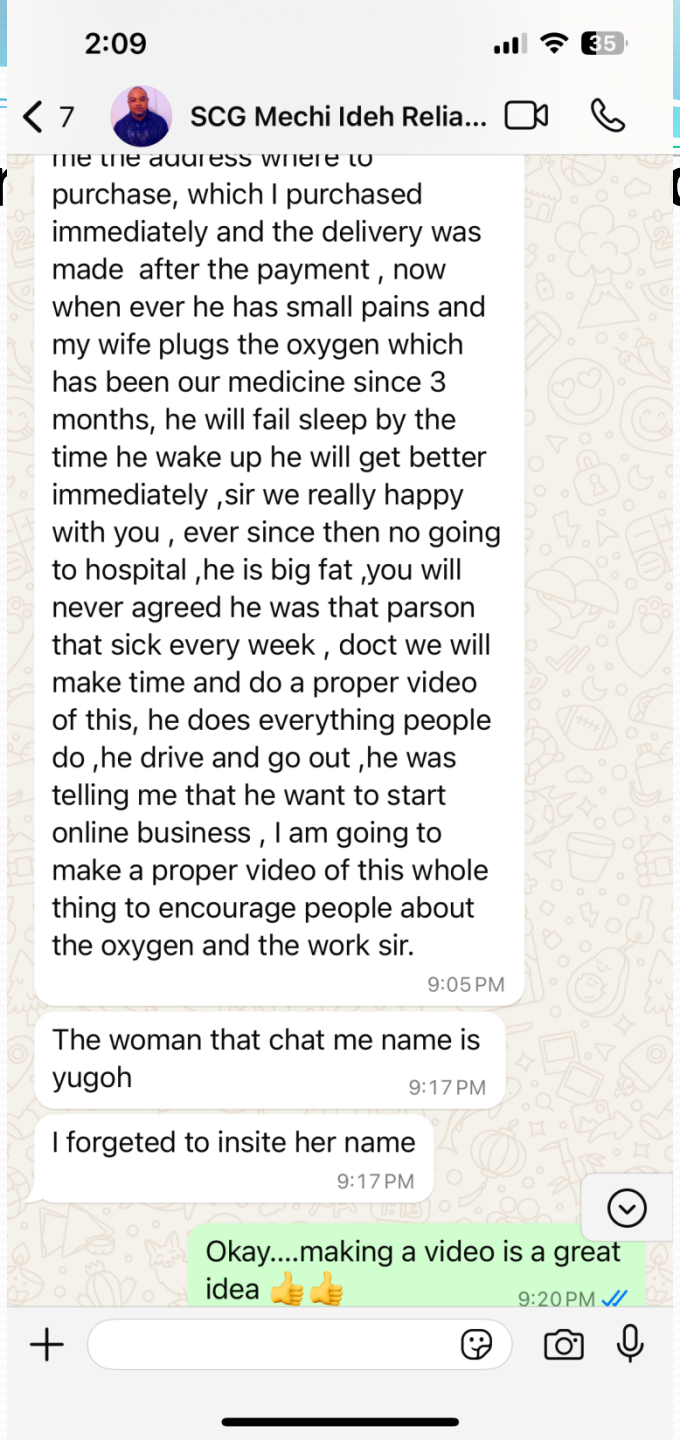

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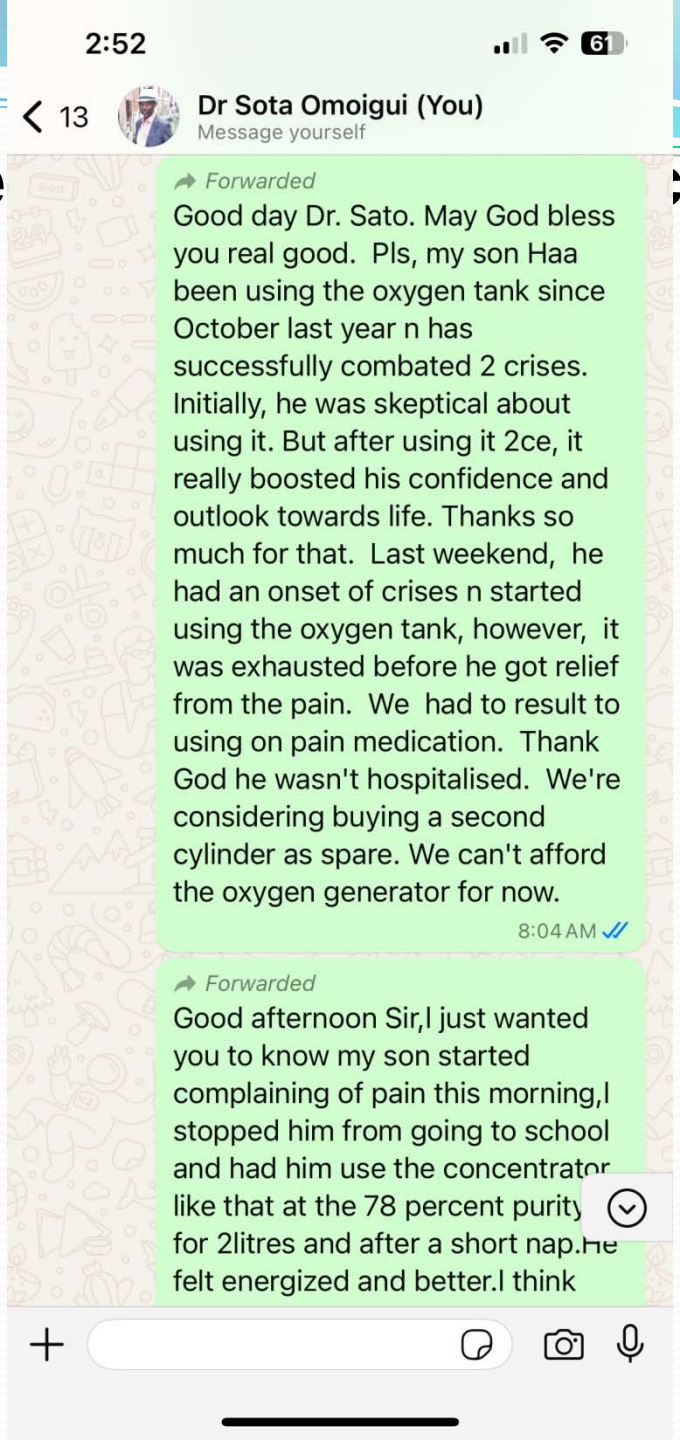

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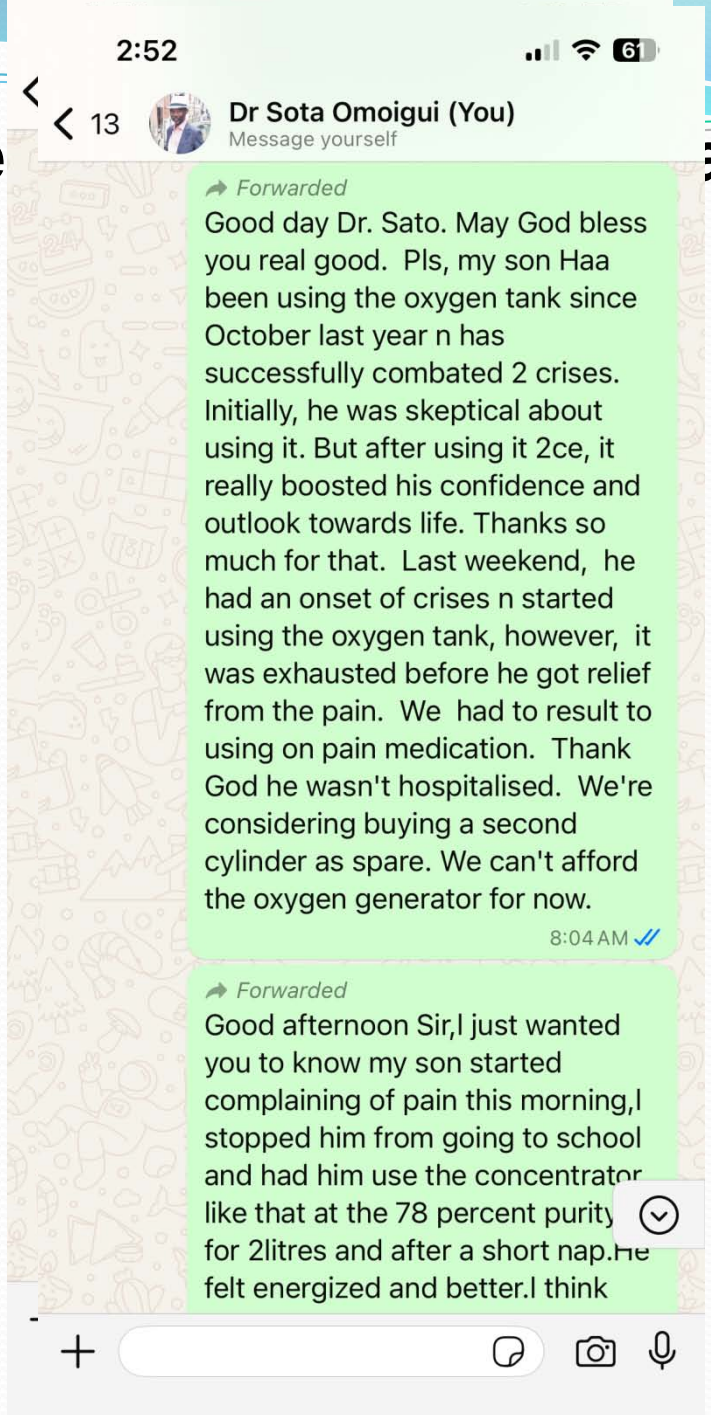

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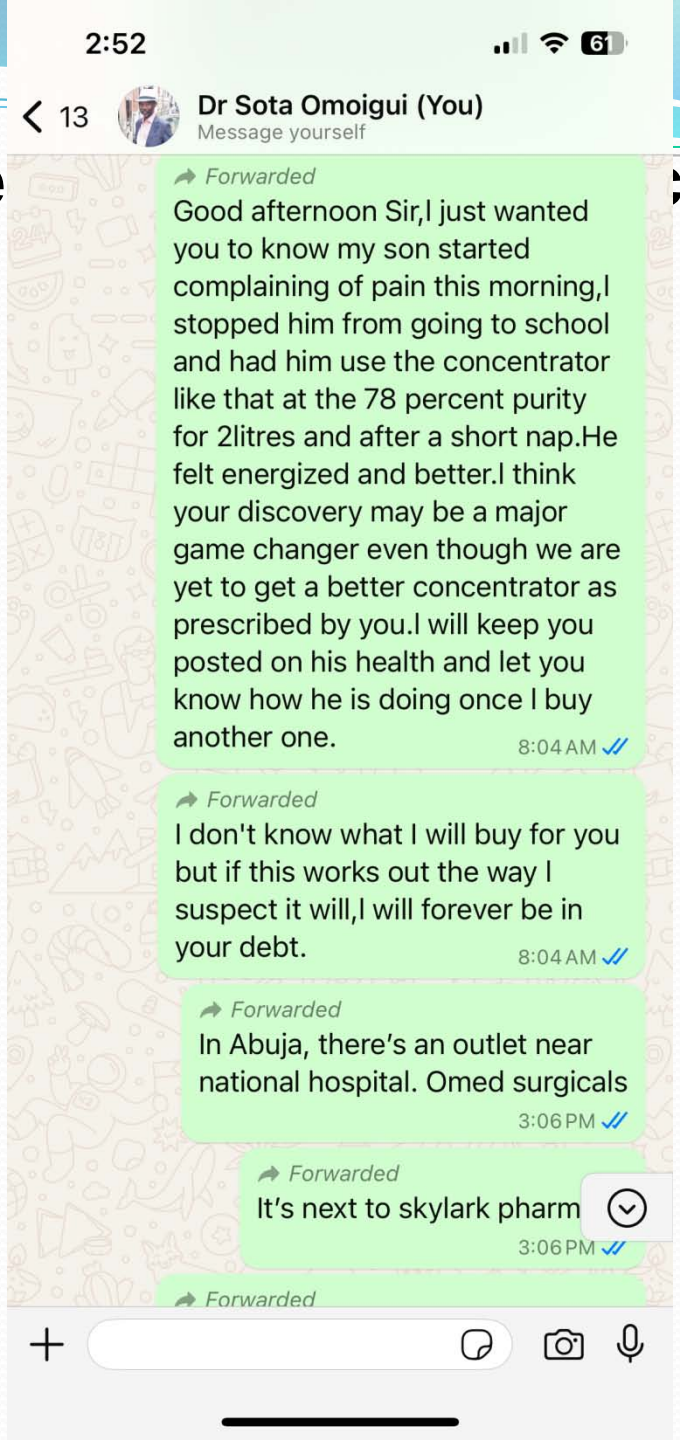

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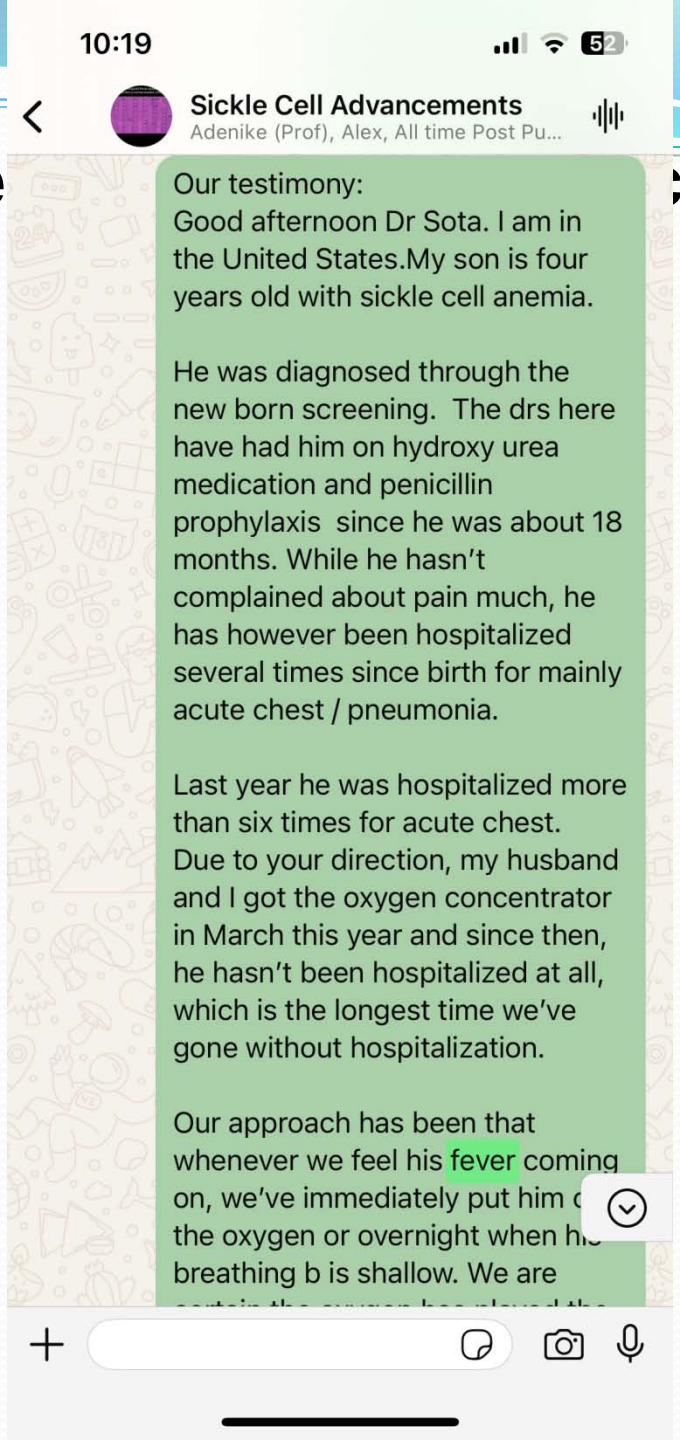

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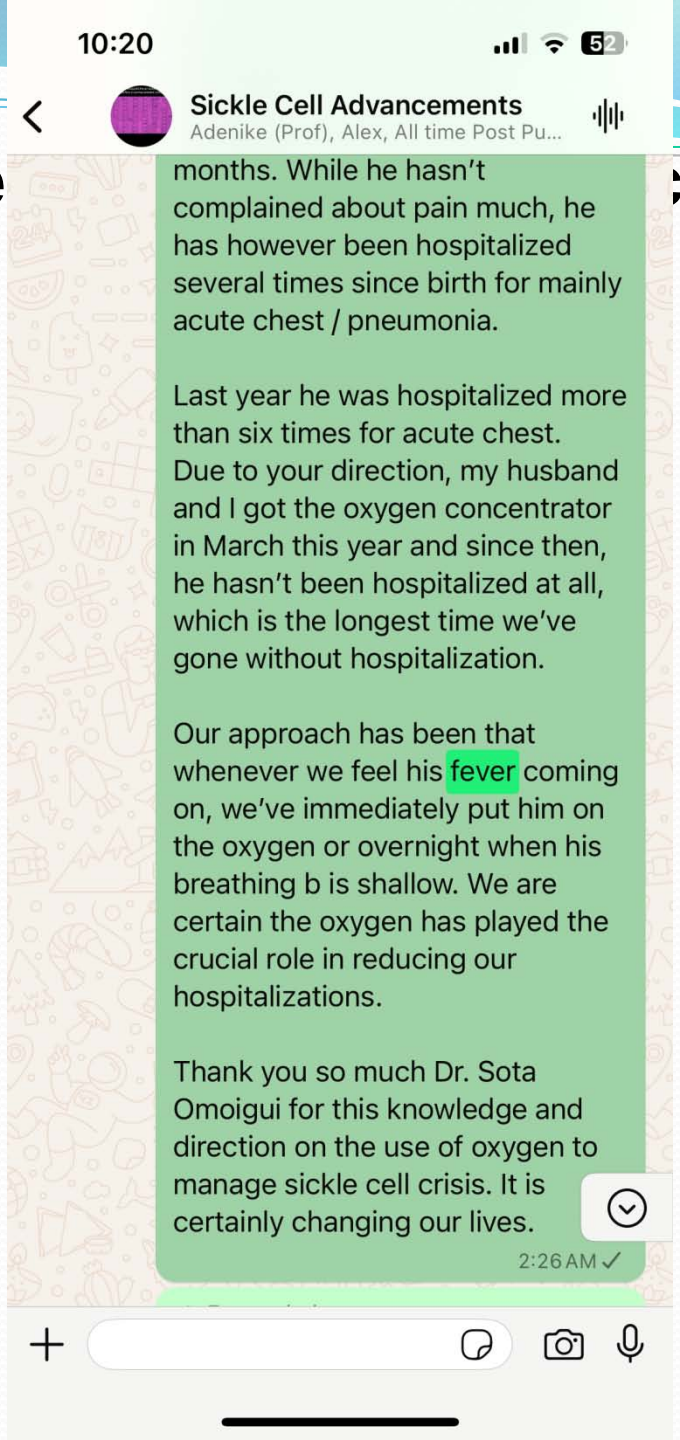


Video Testimony Presentation

Play Video

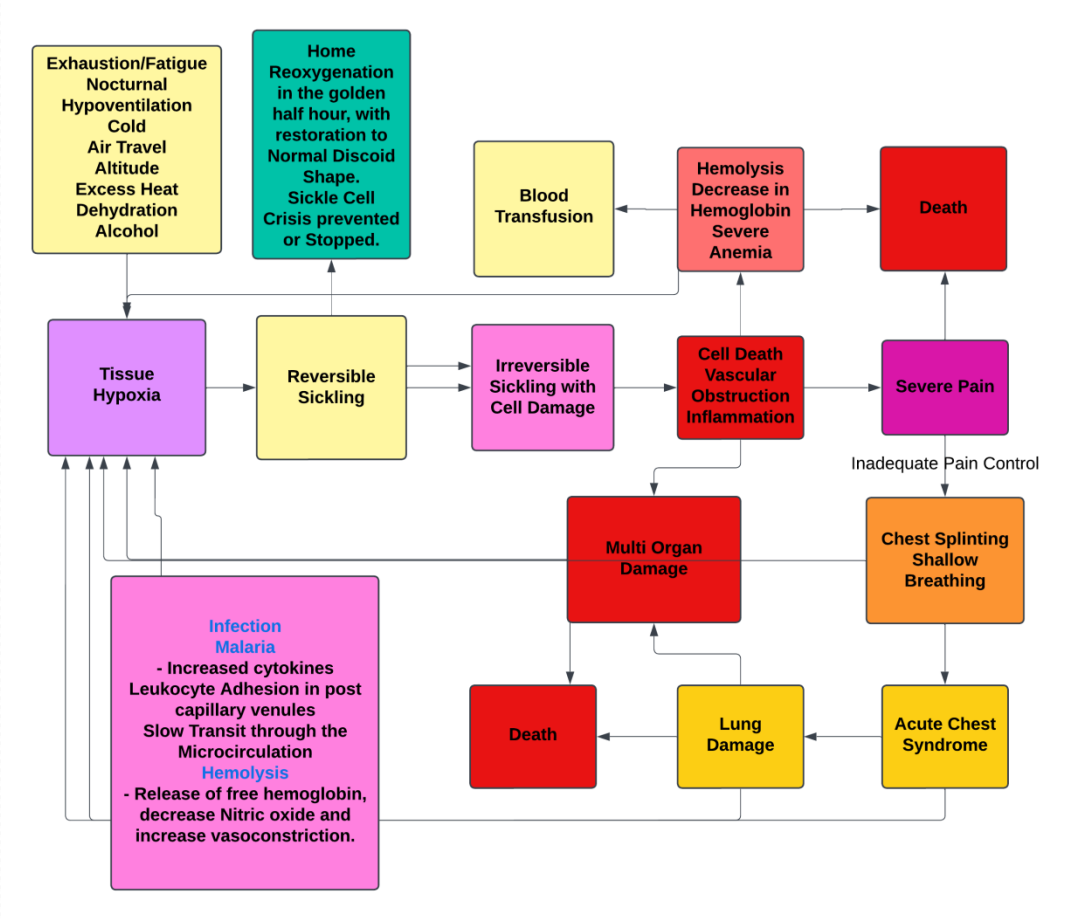
- https://youtu.be/cfoOz1CLX7I?si=WGAcfhUePhxd-LTk

Current Paradigm – M.A.D.

- Patients are treated in a hospital after going into an irreversible sickle cell crisis, wherein the irreversible sickle cells are dead, need to be destroyed by hemolysis, while patients experiencing severe pain, severe decrease in their hemoglobin, multi organ damage and death

- Current paradigm is M.A.D. – Medicine After Death

Current Paradigm – M.A.D.



A Paradigm Shift

- From a reactive treatment approach of the last 100 years of modern medicine, wherein patients are treated in a hospital after going into an irreversible sickle cell crisis, experiencing severe pain and multi organ damage and death

To

- A preventive symptomatic approach where home oxygen restores reversible sickle cells to their normal discoid shape and stops a crisis in the golden half hour, changing lives all over the world.

Diabetes and Sickle Cell Disease

- Diabetes - A death sentence until the isolation of insulin by Frederick Banting and Charles Best in 1921, making it a manageable illness

- Sickle Cell Disease - where home oxygen prevents and stops a crisis in the golden half hour – making hospitalization few and far between, Thus making it a manageable illness

Diabetes and Sickle Cell Disease

THE TORONTO DAILY STAR

30TH YEAR. TWENTY-EIGHT PAGES. TORONTO, WEDNESDAY, MARCH 22, 1922. 5 O'CLOCK EDITION TWO CENTS

TORONTO DOCTORS ON TRACK OF DIABETES CURE

RAILROAD UNIONS IN U.S. MAY JOIN IN MINERS' STRIKE

Coal-Diggers Expect Walkout to Be Hundred Per Cent. Effective.

PLANS ARE MATURING

President Harding May Make a Public Appeal for Co-operation

DIABETES SUFFERERS GIVEN MESSAGE OF HOPE

Discovery Made at University of Toronto Will Be Means of Prolonging Life Considerably—F. G. Banting and C. H. Best Pushed Experiments All Last Summer.

BANTING STAKED HIS ALL ON THE RESULT

"DRY" LAWS HERE CAUSE HARDSHIP IN OLD FRANCE

French Government Anxious for New Trade Agreement With Canada

HOME FOR STUDENTS

Opportunity for One Last Year Sees Philippine Bar the Commissioner

RESERVES OF COAL ARE HIGH IN CITY, PRICE TO GO DOWN

After Strike Trouble President Drake Looks for a Decline

SHUT DOWN IN WEST

Canadian Diggers to Go On Strike Will Be Limited to United States Unions

CIVIL WAR STAGE NOT YET REACHED, BUT DANGER GREAT

People on Both Sides of Ulster Border Apprehend an Attack

NERVES ALL ON EDGE

No Real Meaning of Troops Yet, But Many Horrors Reside.

Imperials May Separate Irish

- As the red blood cells pass through a low oxygen environment within the capillaries, abnormal hemoglobin S forms rigid fibers in the red blood cells, causing them to deform into a sickle shape.
- In the initial phase of a crisis, the golden half hour (30 mins), the red blood cell sickling is reversible with reoxygenation by inhaling oxygen. With repeated sickling, the cell membrane is damaged, the sickling becomes irreversible, the cell dies and will no longer respond to oxygen.
- These irreversible sickle cells block the flow of blood into the organs causing severe pain and damaging the organs. They can only be destroyed and removed by the body through hemolysis, phagocytosis and sequestration causing severe anemia.

THE OCCURRENCE

- 90% of sickle cell crisis occur due to a low oxygen environment which is most often at night or during sleep because of shallow breathing. Any cause of a low oxygen environment may result in a sickle cell crisis
- 5% of sickle cell pain crisis occurs due to cold weather and the remaining 5% of crisis occurs due to infection

FACTORS THAT INITIATE OR AGGRAVATE A PAIN CRISIS - AND SOLUTIONS

- Low Oxygen Environment due to shallow breathing while lying down or sleeping. Use oxygen from an oxygen cylinder or an oxygen concentrator at a flow rate of 1.5-2 liters/ minute to prevent or within the first 30 minutes that the crisis starts. Sleep with oxygen if you have had a long day, you are tired, you drank alcohol, took a plane flight, traveled to a high altitude city, been exposed to the cold, have an infection or you do not feel well.
- Pain. Causes shallow breathing and results in a low oxygen environment that increases sickling, worsens a pain crisis and can result in an acute chest syndrome that has the highest mortality. Treat promptly with potent opioids such as Morphine, Hydromorphone, Pethidine, Fentanyl or Ketamine combined with anti-inflammatories like Diclofenac or Ketorolac administered IM or IV. Pentazocine or Tramadol are weak opioids, with ceiling effects, will not relieve the pain and should never be used to treat a sickle cell crisis.
- Cold Environment / Excess Heat/ Physical exertion / Dehydration/ Stress / Pain can all cause a crisis. Keep warm, avoid excess heat, use oxygen after exertion, keep hydrated, minimize stress, have pain treated effectively. Sleep with oxygen if you do not feel well.
- Alcohol - Sleep with oxygen when you drink it.
- Aircraft are pressurized to 8000 ft., which is a low oxygen environment, that will result in a sickle cell crisis either during the flight or after. You must use oxygen when you fly. Request compressed medical oxygen from the airlines or permission to take along an FAA approved oxygen concentrator such as Sequal Eclipse.
- Incompatible Blood Transfusion - Use oxygen within the golden half hour to prevent or treat a crisis that can lead to hemolysis, worse anemia and blood transfusion.
- Infection - Treat immediately. Seek medical attention promptly.
- Malaria. Prevent by using mosquito nets, environmental sanitation and medication like malarone. Treat promptly with Artemesinin combination therapy.
- Medications like Voxelotor (Oxbryta) allow Hemoglobin S to retain oxygen, will result in less destruction of the red blood cells and increase the hemoglobin to near normal or normal. But will not stop a crisis.
- An older medication, hydroxyurea increases production of fetal hemoglobin and decreases the amount of abnormal Hemoglobin S. This results in fewer sickle cells, less destruction of the red blood cells but also does not stop a pain crisis

TREATMENT

- Should you wake up in a crisis, immediately apply oxygen as administration of oxygen within the golden half hour (30 mins) of a crisis, can abort the crisis as Hgb S polymerization is reversible within the golden half hour.
- Obtain oxygen from an oxygen cylinder or a continuous flow oxygen concentrator at a minimum flow rate of 1.5-2 liters per minute, with an oxygen purity of 93% +-3% across all flow rates. Do not use a pulse dose concentrator as that requires you to inhale before it delivers the oxygen.
- Using oxygen within the golden half hour will change a long hospital stay crisis with multi-organ damage to a 30-minute crisis with no organ damage.
- Should you fail to apply oxygen within the golden half hour or you applied oxygen and could not stop the crisis, then seek immediate medical attention.
- Be safe with oxygen. Avoid smoking or use of any electrical objects such as electric blankets, hair dryers, open flames or flammable materials near an oxygen cylinder or oxygen concentrator.
- Cure: Bone marrow transplant or Gene Therapy.

Sota Omoigui, MD
Discoverer of the first solution in 7300 years
'Let oxygen be your medicine'

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It takes a village to bring a discovery to the world

Honorable Mentions

- Dr Edwin Osahiere Eribo (RIP) – first to point out the need for oxygen in air travel for patients with sickle cell disease
- Dr Nowa Omoigui (RIP) – first to believe in my theory of using oxygen to prevent a sickle cell crisis
- Dr Ogie Asemota – unquestioned acceptance and validation of my theory
- Dr Tunde Asemota– advised to take the discovery directly to the public

Honorable Mentions

- Helen Omoigui RN,BSN,PHN – proof read and made suggestions as I formulated my theory
- Isiuwa Omoigui BA – produced the poster to explain the theory to the lay public
- Ifueko Omoigui Okauru MFR– organized the WhatsApp group to bring the discovery to a wider audience
- Dr Abayomi Osunkoya and his Wash949FM.com radio station in Lagos, Nigeria– the first radio interview to broadcast the discovery to the world on September 19th, 2024

Honorable Mentions

- Dr Anthony Kingsley – San Antonio Community Health Center – for the first Zoom conference on September 19th, 2024, where this discovery was announced.

- Meg Ogbeide Uzzi RN – Edo National Association Worldwide - Women Affairs Coordinator – organized the second Zoom Conference on December 14th, 2024 to announce this discovery.

Honorable Mentions

- Dr Tunde Fakunle – has embraced this discovery and made invaluable contributions in sharing it with the world

- Prof Kolade Ernest – also embraced the discovery and has been at the vanguard of sharing it with the world.

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Questions