

[HEART BEATING IN CHEST W/ MUSIC]

[WHEN I FIRST HEART MY DAD'S IRREGULAR HEARTBEAT IT KIND OF SCARED
ME OH MY GOSH THATS NOT NORMAL AT ALL THATS REALLY BAD THATS
UNHEALTHY BUT ITS ALSO KIND OF LIKE ITS KIND OF LIKE I CANT GET THE
WORD OUT ITS KIND OF COMFORTING]

THE HEART IS WHAT KEEPS YOU ALIVE. SO... WHAT HAPPENS WHEN YOUR
HEART STOPS WORKING?

[HEARTBEAT AND MUSIC STOP]

THAT'S A QUESTION DOCTORS HAVE HAD TO ANSWER FOR CENTURIES. AND
WITH HEART DISEASE BEING THE NUMBER ONE CAUSE OF DEATH WORLDWIDE,
IT'S AS URGENT AS EVER.

[THEME MUSIC]

MY NAME IS UMA KOCHERLAKOTA AND YOU'RE LISTENING TO IN THE BOOKS, A
PODCAST ABOUT STORIES OF MEDICINE IN HISTORY. THIS EPISODE IS ABOUT
BILL SCHROEDER, THE SECOND PERSON TO RECEIVE THE JARVIK SEVEN
ARTIFICIAL HEART.

[THEME MUSIC END]

TODAY, I'M JOINED BY ERIN ODYA, ANATOMY TEACHER AT CARMEL HIGH SCHOOL.

[BED START]

[THE BLOOD'S JOB IS TO CARRY UH RESOURCES TO ALL THE CELLS AND THE BLOOD HAS TO MOVE IN ORDER FOR IT TO GET PLACES SO THE HEART IS THE POWER BEHIND THAT]

[BED END]

THE HEART AFFECTS EVERY OTHER PART OF THE BODY. SO, FOR MANY PEOPLE, THE FIRST PLACE TO TURN TO WHEN THEIR HEART STOPS WORKING IS A WAITING LIST FOR A DONOR HEART. BUT DONOR HEARTS ARE RARE, AND A LOT OF PEOPLE DON'T HAVE THIS OPTION, MAYBE BECAUSE OF AGE, LACK OF AVAILABILITY, OTHER HEALTH CONDITIONS, OR MAYBE BECAUSE IT'S JUST TOO EXPENSIVE FOR THEM. BUT IN THE MID-1980'S, SCIENTISTS CAME UP WITH ANOTHER ALTERNATIVE: THE JARVIK SEVEN, THE FIRST FULLY FUNCTIONAL ARTIFICIAL HEART.

AT ITS MOST BASIC, THE JARVIK SEVEN WORKS LIKE THIS:

FIRST, IT GETS BLOOD FROM THE EXISTING VESSELS,

[BED START]

[THE SUPERIOR VENA CAVA AND THE INFERIOR VENA CAVA BRING BLOOD INTO
THE HEART]

NEXT, IT SENDS THAT BLOOD TO THE LUNGS TO RECEIVE OXYGEN

[IT GOES FROM THE RIGHT ATRIUM TO THE RIGHT VENTRICLE TO THE
PULMONARY ARTERIES TO BE OXYGENATED]

FINALLY, IT SENDS THAT OXYGENATED BLOOD OUT INTO THE BODY THROUGH
THE AORTA

[AFTER THE BLOOD COMES BACK FROM THE LUNGS IT GOES THROUGH THE
RIGHT ATRIUM, THEN THE RIGHT VENTRICLE, AND UP THROUGH THE AORTA TO
YOUR BODY]

[BED STOP]

IT'S POWERED BY A LARGE EXTERNAL AIR COMPRESSOR, ABOUT THE SIZE OF A
SHOPPING CART.

DOCTOR BARNEY CLARK, A SEATTLE DENTIST, WAS THE FIRST PERSON TO RECEIVE THE JARVIK SEVEN, AND HE LIVED FOR ONE HUNDRED AND TWELVE DAYS. BUT IT WAS WILLIAM SCHROEDER, FROM JASPER, INDIANA WHO MADE HISTORY BY LIVING THE LONGEST OF ANY PATIENT WITH AN ARTIFICIAL HEART.

IN HIS FIFTIES, SCHROEDER SUFFERED A SERIES OF HEART ATTACKS - OR, MYOCARDIAL INFARCTIONS

[BED START]

[WHAT THAT LITERALLY MEANS IS THAT HEART TISSUE HAS DIED. YOU HAVE BLOCKAGE IN WHAT ARE CALLED THE CORONARY ARTERIES AND THEY BRANCH UM RIGHT OFF OF THE MAIN EXIT TUBE WHICH IS THE AORTA, THERE'S A HUGE AMOUNT OF PRESSURE HERE, AND SO THAT PRESSURE IS ALSO TRANSLATED TO THE CORONARY ARTERIES, AND THEY'RE NOWHERE NEAR AS BIG AS THE AORTA, SO THEY'RE PRONE TO HAVE LITTLE BITS OF DAMAGE OVER TIME. IF YOU PAIR THAT WITH THINGS LIKE HIGH CHOLESTEROL, THE ALL THE CHOLESTEROL AND THE STICKY BITS OF STUFF START GETTING STUCK IN THOSE LITTLE MICRO TEARS AND THEN MORE AND MORE GETS STUCK AND EVENTUALLY YOU CAN GET TO THE POINT WHERE THE WHOLE ROAD THE CORONARY ARTERY THAT'S SUPPLYING THE WALL OF THE HEART BECOMES

TOTALLY BLOCKED. THEN EVERYTHING THAT RECEIVES BLOOD FROM THAT ARTERY IS NOW NOT GETTING OXYGEN]

[BED STOP]

HIS HEART JUST COULDN'T KEEP UP. HIS HEALTH DECLINED RAPIDLY, AND EVENTUALLY HE WAS DIAGNOSED WITH HEART FAILURE.

[HEART FAILURE IS WHEN IT'S NOT DOING GOOD ENOUGH IT CAN STILL BE PUMPING BUT IT'S JUST NOT PUMPING ENOUGH VOLUME OR ITS NOT GENERATING ENOUGH FORCE WHEN IT IS PUMPING]

IT WAS TERMINAL.

DOCTOR WILLIAM DEVRIES A PIONEER OF THE JARVIK SEVEN, SAW SCHROEDER NOT AS A TERMINAL PATIENT, BUT AS A TEST SUBJECT FOR HIS PROMISING NEW DEVICE.

[BED START]

AFTER A SEVEN HOUR SURGERY SCHROEDER WOKE UP WITH A FULLY FUNCTIONAL HEART. THINGS WERE LOOKING UP.

BUT DESPITE ALL THAT OPTIMISM, SCHROEDER'S CONDITION DECLINED RAPIDLY. AFTER ONLY EIGHTEEN DAYS, HE SUFFERED THE FIRST OF A SERIES OF STROKES THAT LEFT HIM DEBILITATED, AND EVENTUALLY, BRAIN DEAD.

[BED STOP]

[BLOOD RUSHING THROUGH BRAIN ARTERY AUDIO]

WHAT YOU'RE HEARING IS THE SOUND OF BLOOD RUSHING THROUGH THREE MAJOR ARTERIES IN THE BRAIN: ANTERIOR CEREBRAL, MIDDLE CEREBRAL, AND TERMINAL INTERNAL CAROTID. IT WOULD BE BLOCKAGES IN THESE ARTERIES, ALONG WITH MANY OTHERS THAT LEAD TO THE BRAIN, THAT WOULD CAUSE WILLIAM SCHROEDER TO DIE SIX HUNDRED AND TWENTY DAYS AFTER BEING IMPLANTED WITH THE JARVIK SEVEN ARTIFICIAL HEART.

[SO NOW INSTEAD OF HEART MUSCLE CELLS DYING ONE AT A TIME BECAUSE OF LACK OF SUPPLY NOW ITS BRAIN CELLS STROKES A LOT OF TIME THAT CAN COME ALONG WITH HAVING A PREVIOUS HEART ATTACK OR SOMETHING BECAUSE UM YOU BASICALLY FORM A BLOOD CLOT AND THAT CAN GET KNOCKED LOOSE AND IF THAT TRAVELS UP NEAR THE BRAIN, YOU PROGRESSIVELY LOSE BRAIN FUNCTION LIKE MORE EACH TIME]

BUT THERE IS HOPE. WHEN BILL SCHROEDER LIVED WITH AN ARTIFICIAL HEART FOR SIX HUNDRED AND TWENTY DAYS, HE NOT ONLY MADE HIS OWN LIFE LONGER, BUT HE IMPROVED THE LIVES OF THOUSANDS OF PEOPLE. NOWADAYS, DEVICES LIKE THE JARVIK SEVEN ARE USED AS A BRIDGE BETWEEN THE REMOVAL OF A DISEASED HEART AND A TRANSPLANT OF A DONOR ONE.

[BED START]

BUT FOR THE MANY PEOPLE WHO ARE WAITING FOR A HEART TRANSPLANT, NEW TECHNOLOGY SHOWS PROMISE.

[A FULL ARTIFICIAL HEART IS LIKE THE HOLY GRAIL OF MEDICINE, SO SO FAR SO GOOD, AND I BELIEVE THAT THERE WILL BE ONE IN THE NEAR FUTURE]

[BED STOP]

I FOUND THE INFORMATION IN THIS STORY ABOUT BILL SCHROEDER FROM THE BIOGRAPHY THE BILL SCHROEDER STORY, WRITTEN BY THE SCHROEDER FAMILY AND JOURNALIST MARTHA BARNETTE. MORE INFORMATION ABOUT THIS CAN ALSO BE FOUND IN THE NEW YORK TIMES ARCHIVES, FROM AUGUST 1986. THE AUDIO OF THE BRAIN ARTERY IS FROM THE WORLD ACCORDING TO SOUND AND WAS PRODUCED BY CHRIS HOFF. YOU CAN CHECK IT OUT AT THEWORLDACCORDINGTOSOUND-DOT-ORG.

FOR 91.3 WHJE, THIS HAS BEEN UMA KOCHERLAKOTA. FOR MORE STORIES LIKE THIS, VISIT WHJE.COM, AND SEARCH IN THE BOOKS, A PODCAST ABOUT MEDICAL HISTORY.