
HEROES
OF
HEALTH
1913

100 years of life-changing discoveries

MRC Medical Research Council

CENTENARY 1913-2013

Celebrating 100 years of the Medical Research Council

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What is MRC?

MRC stands for Medical Research Council. MRC is one of seven UK research councils funded by the taxpayer - through the government science budget - to study the basis of health and disease. MRC funds the work of almost 6000 scientists in the UK and Africa. Their work helps to improve the way that diseases are treated. In 1913, when MRC began, people didn't know about vitamin-deficiency disease, or what caused flu. And there were no vaccination programmes to protect against infectious diseases like tuberculosis, measles or typhoid.

Heroes of Health: 1913 introduces Sirs Henry Dale and Almroth Wright and Dame Harriette Chick, whose pioneering research on the prevention and treatment of disease has changed the lives of people in the UK and across the world. Many of the diseases that were common 100 years ago are rare today thanks to them and their colleagues. Pupils can play the *Patient Game* to learn about diseases that were common in the past. Some are still common today, like heart disease, the leading cause of death in the world. Pupils can make their own *Patient Game* cards to imagine the diseases of the future and how scientists will help improve the way that doctors treat patients.

Primary school pupils across the UK are invited to submit creative works for the **Imagine the Future: Competition**. Selected works will be exhibited to celebrate 100 years of the MRC as part of an interactive live-lab installation in 2013. For details of how to take part, teachers should visit *www.csc.mrc.ac.uk/centenary* to download the teacher's pack.

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HOW MRC WAS BORN


CONGRATULATIONS HENRY! YOU ARE A DOCTOR NOW.
GO HENRY!
WOO HOO!


BUT REMEMBER!
MEDICINE IS NOT
A SCIENCE!


LLOYD GEORGE AT THE GOVERNMENT OFFICE
GIVE JUST 4P A YEAR AND GET SICK PAY.
TOO EXPENSIVE HO HO!
URGHH! I FEEL SICK NOW!
UH-OH. I ONLY HAVE 2P!


HOW CAN WE FIND CURES IF WE DON'T DO THE RESEARCH
IT WAS T.B. THERE WAS NOTHING THEY COULD DO...
Nooooo


NOW THEN! HERE IS MORE MONEY FOR HOSPITALS AND TREATMENT
BUT SIR! WE NEED MONEY FOR RESEARCH!
T.B
T.B
T.B
T.B
DOOMED
1/1/1913


HOSPITALS NEED BETTER TREATMENTS OTHERWISE PEOPLE WILL KEEP DYING!
HMM... SO WHAT DO YOU SUGGEST THEN?
IF MORE PEOPLE LIVE, MORE PEOPLE WILL VOTE FOR ME... GREAT!


I'LL USE THE MONEY TO START A RESEARCH LABORATORY ...
CURE
I WILL GIVE YOU 1P FOR EVERY 4P I COLLECT..


SCIENTISTS WANTED T.B KILLS 50-000 IN 1911 CAN YOU HELP?
BRITAIN NEEDS YOU! Scientists
KEEP CALM AND DO SOME SCIENCE
HELLO? HELLO! I NEED YOUR HELP!
COUNT ME IN HENRY!
OKAY HENRY! WE NEED GOOD MEN FOR THIS JOB!

AND THAT WAS HOW THE MEDICAL RESEARCH COUNCIL STARTED.

HENRY AND THE FUNGUS


IN THE MIDDLE AGES PEOPLE WERE GETTING SICK SIMPLY BY EATING BREAD!
MMM... NOM NOM NOM
1
ARGHHH! I'M ON FIRE!
2
3
OH NO! I'M DYING.
THEY CALLED IT ST ANTHONY'S FIRE! IT WAS FROM RYE WHICH WAS INFECTED WITH ERGOT


IS IT NOT EXTRAORDINARY THAT A LITTLE FUNGUS COULD MAKE ANYBODY FEEL AS THOUGH THEY WERE ON FIRE!
THE MIND BOGGLES
INDEED HENRY
RYE
X


WE NEED TO TAKE A CLOSER LOOK!
ERGOT OF RYE


WHAT CHEMICALS ARE IN THE FUNGUS?

HENRY TESTS THE CHEMICALS...

ONE OF THE CHEMICALS HAS AN EFFECT

A FEW YEARS LATER...


BUTCHER
I NEED SOME MEAT PLEASE...

BACK IN THE LAB...

HENRY WONDERS HOW THE CHEMICAL WORKS...

HENRY FINDS THE SAME CHEMICAL IN THE MEAT.


I DO BELIEVE THIS IS THE BASIS OF OUR NERVOUS SYSTEM!

SOME TIME AFTER...

WRIGHT AND THE BACTERIA

WHEN WORLD WAR ONE BROKE OUT


RIGHT! WRIGHT WE NEED TO KEEP AS MANY MEN ALIVE TO FIGHT AS WE CAN!!
GENERAL, IT IS ESSENTIAL THESE MEN ARE PROTECTED FROM TROPICAL DISEASES!

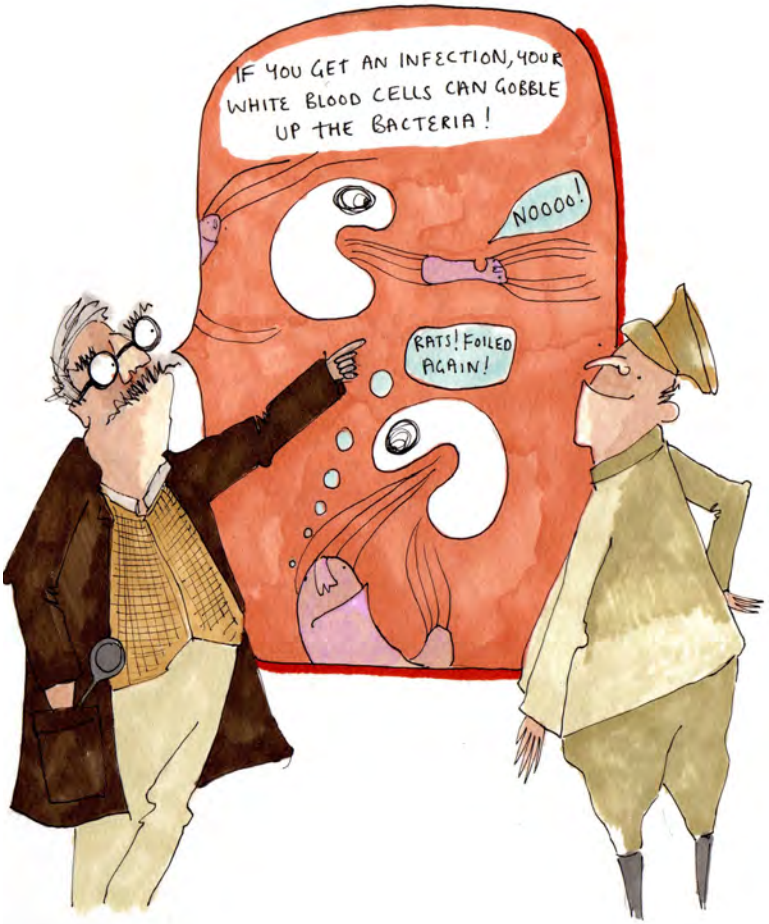
WRIGHT TAKES THE GENERAL TO HIS LAB...

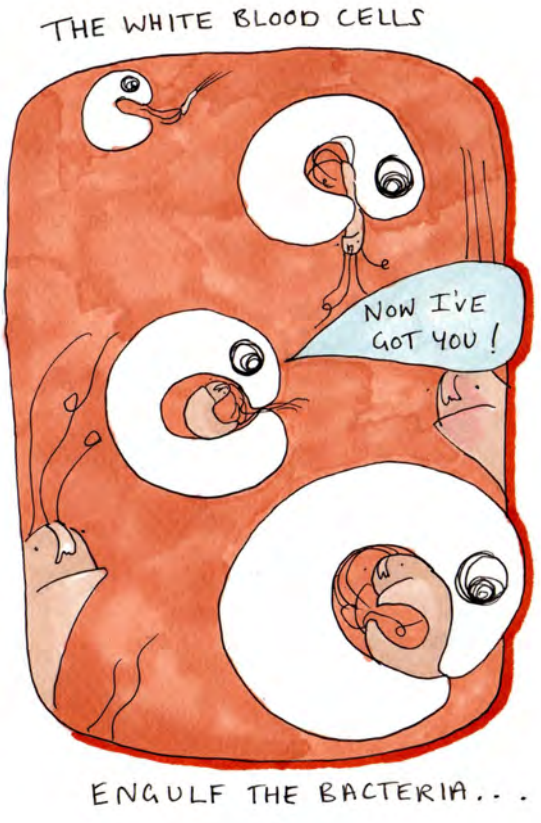

BUT WITH MY VACCINE HUNDREDS OF THOUSANDS GET PROTECTION!
HOW DOES IT WORK?


WELL, FIRST WE HEAT THE BACTERIA...
ARGHHH!


THEN I INJECT THE TREATED BACTERIA ...
DON'T WORRY GENERAL!
...ERRR


SHOULD YOU MEET AGAIN, YOUR BODY REMEMBERS THE BACTERIA
I FEEL A LITTLE FAINT!


IF YOU GET AN INFECTION, YOUR WHITE BLOOD CELLS CAN GOBBLE UP THE BACTERIA!
NOOOO!
RATS! FOILED AGAIN!


THE WHITE BLOOD CELLS
NOW I'VE GOT YOU!
ENGULF THE BACTERIA...


BUT DOESN'T IT MAKE MORE SENSE TO JUST TREAT THE SICK MEN.
AHH... THE ANSWER IS PREVENTION, GENERAL, NOT CURE!

AND 120,000 SOLDIERS WERE VACCINATED
SAVING THEM FROM DYING OF TYPHOID.

HARRIETTE AND THE SUNSHINE

AFTER THE WAR

THE TRAIN TO VIENNA

HARRIETTE KNEW IT WASN'T THAT SIMPLE...


OKAY CHILDREN LET'S GET SOME FRESH AIR!!
?!!!
ARGHH!


TRUST ME HERR DOCTOR!
WHAT ARE YOU DOING?? THESE KINDERS ARE SICK!!

HARRIETTE WATCHES THE CHILDREN GETTING BETTER


BACK IN LONDON...
FRED, THE CHILDREN GOT MUCH BETTER WITH COD LIVER OIL AND SUNLIGHT...
DO YOU THINK IT MIGHT BE VITAMINS?
CO
ZZZZ


EUREKA! THE SUNLIGHT MUST TRIGGER VITAMIN PRODUCTION
?
YOU SEE! I TOLD YOU SHE WAS BRILLIANT!

Patient Cards

Cut out the cards and play the Patient Game with your classmates. See page 53 to find out how to play


RYE
COD
LIVER

Patient Cards

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RYE
COD
LIVER

The Patient Game (Past) Rules of Play

A game designed for 9-11 year olds to play in the classroom

1. Cut out or photocopy the patient, doctor and scientist cards

2. Divide up pupils into teams of three or four

3. Decide who in the group will be the patient (one person), who will be the doctor (one person) and who will be the scientist(s) (one to two people)

4. Copy the doctor and scientist cards for each group (only one patient card is needed per group)

5. The teacher will give one patient card to each group (six maximum)

6. When the teacher starts the clock, the patient should act out his/her symptoms

7. The doctor uses the doctor card to identify the correct disease

8. Then, the scientist finds the right scientist card in order to identify the cause of disease and a possible treatment

9. The teacher notes down the time taken by each group, and rewards may be given

The Patient Game (Future) Rules of Play

1. Pupils split into groups of three to four

2. Each group discusses which diseases might be common in 100 years time

3. The group can choose diseases they already know or imagine a new disease

4. Each group makes their own patient card (with their chosen/imagined disease) using the template on page 51

5. Groups now create a scientist card for their disease describing its cause and possible treatment, and how likely the patient will be to recover from the disease

6. Groups submit their patient and scientist cards to the teacher

7. The teacher makes up a new doctor's card based the patient cards collected from all groups (removing any duplicates)

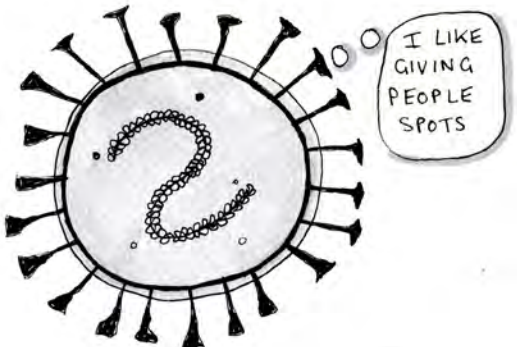
8. The teacher appoints pupils in each group to be the patient, doctor or scientist(s)

9. The teacher gives the patient in each group a patient card (making sure not to give a group a disease that they created)

10. Repeat steps 6-9 on page 53

Patient Game: Scientist Card for Measles

Measles is an infectious [IN-FEC-SHUS] disease caused by a virus. Viruses are too small to see, but can cause big problems. They can spread from one person to another through the air. They copy themselves when they get inside the body. The measles virus gives us fever, rash, a cough and lots of small red spots. There is no specific treatment for measles, although patients can take paracetamol [PA-RA-SEED-AMOL] to help with symptoms. They should get better after several days rest. If they are very young, or have low immunity [IM-YOON-IT-EE], there is a risk of death



100 years ago, many children died of measles. Today, measles is rare in the UK, because most children get an injection or vaccine [VAX-EEN]

The measles vaccine (MMR) combines protection against measles, mumps and rubella (German measles). Children get their first injection aged one year, and then again between three and five years of age. Today these infectious conditions are at an all-time-low.

In the past, scientists thought that measles was caused by a bacterium [BAC-TEAR-EE-UM]

Scientist Card

Patient Game: Scientist Card for Typhoid

Typhoid is caused by bacteria [BAC-TEAR-EE-YA] that get into people's food or drinking water. They are very small, so you can't see them

The bacteria can spread from person to person, for example when shaking hands after going to the toilet without washing them

Once inside the body they can make more of themselves. This makes the patient feel ill. The bacteria are called *Salmonella* [SAL-MON-ELLA] *typhi* [TIE-FEE]

Typhoid can be cured by antibiotics [AUNTIE-BYE-AWE-TIX] which can be taken as tablets. Typhoid is rare in the UK today, but if people travel to foreign countries, like Africa or South America, they can get a vaccine [VAX-EEN] to help protect them from the bacteria

Some people are naturally immune [IM-YOON] to typhoid. One example from 100 years ago is 'Typhoid Mary', who carried the bacteria. She didn't get ill, so without knowing it, she spread the bacteria to lots of other people, who got sick

Over 100 years ago the Victorians throught that typhoid was caused by bad smells

Scientist Card

Patient Game: Scientist Card for Scurvy

Scurvy is caused by a lack of vitamin C. The body cannot make its own, so all the vitamin C comes in the diet. Vitamin C is necessary for us to make collagen [CALL-A-JEN], which helps hold our bodies together. The patient should be put on a healthy balanced diet, with plenty of oranges. Vitamin C tablets should also be taken. After a couple of days they should start to feel better

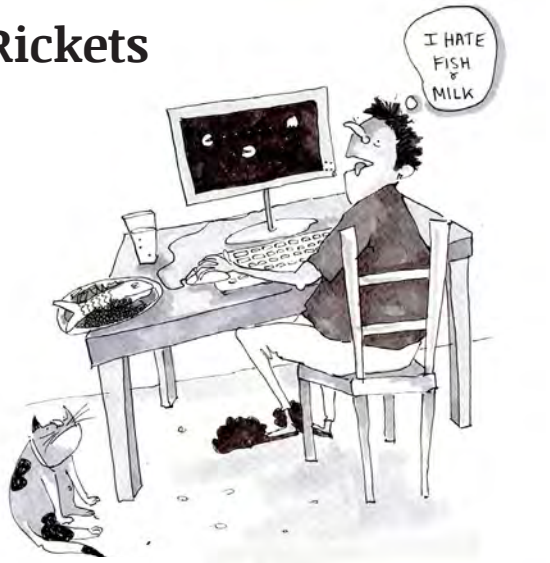
Scurvy is rare all over the world now. In the past, sailors and pirates suffered from the problem, because ships couldn't keep fruit and vegetables fresh on long ocean voyages. Unlike humans, most animals can make their own vitamin C. Humans, some monkeys and apes, guinea pigs, bats and some species of bird all have to get the vitamin from their food. Citrus fruits, tomatoes, potatoes, cabbage and green peppers are all good sources

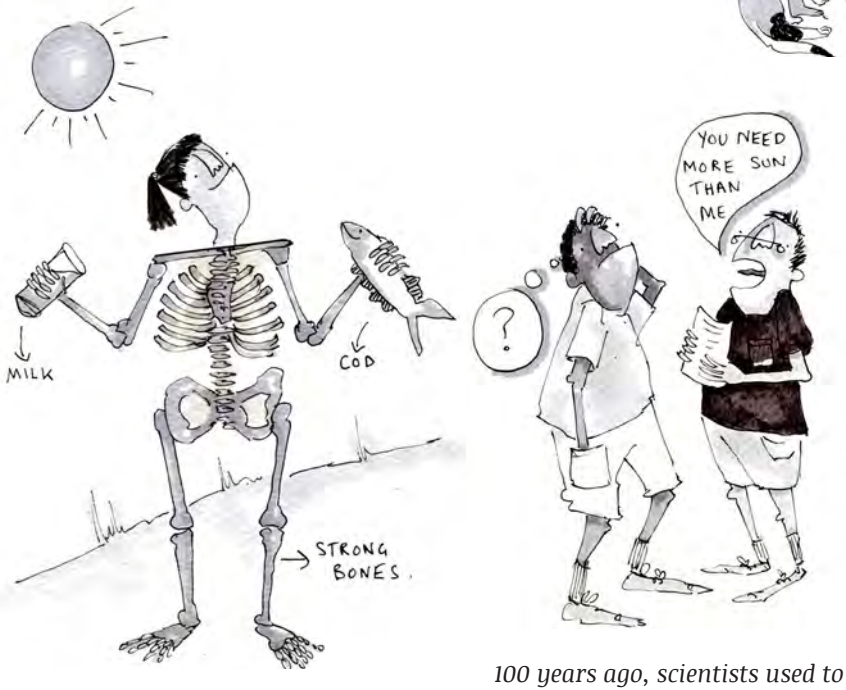
100 years ago, scientists used to think that scurvy was caused by waste products from bacteria [BAC-TEAR-EE-YA] found in canned meat

Scientist Card

Patient Game: Scientist Card for Rickets

Rickets is caused by a lack of vitamin D. Unlike other vitamins, the body can make its own D with enough sunlight. Vitamin D helps calcium [CAL-SEE-YUM] (from milk) move into the gut. If calcium can't get into the blood stream, bones can get soft, bend and break. For children who are still growing, this can cause their legs or arms to get twisted. Patients with rickets can get vitamin D from cod-liver oil, which they can take as liquid or tablets. They also need plenty of calcium from milk, and sunlight





Rickets is rare in the UK today, compared to 100 years ago. However, there have been a number of recent cases reported. There is a worry that children, who refuse to eat dairy and/ or fish, and who play computer games for long hours indoors, may not get what they need in their diet and from the sun to make vitamin D. In some African countries, rickets is still a problem, because darker skin needs more sunlight to make vitamin D

100 years ago, scientists used to think that rickets was caused by a virus

Scientist Card

Patient Game: Scientist Card for TB

TB is short for Tuberculosis [CHEW-BUR-CUE-LOW-SIS], which is caused by bacteria [BAC-TEAR-EE-YA], spread from person to person when they cough, sneeze or spit, through the air. They are also found in cow's milk, if not heat treated

If breathed into the lungs, the bacteria can make you ill. Once inside the body they can make more of themselves. Treatment with antibiotics [AUNTIE-BYE-AWE-TIX] kills off the bacteria allowing the patient to heal. Antibiotics don't always work, because the bacteria can become resistant [RE-ZIS-TANT] to them

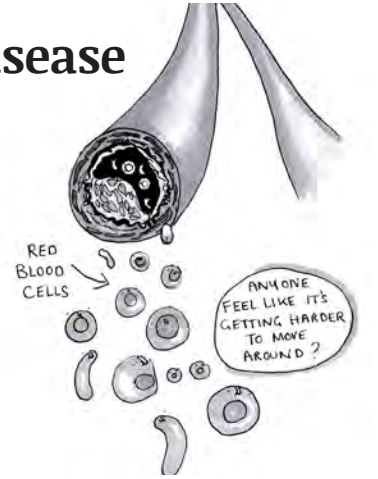
100 years ago, people thought that TB was caused by vampires

TB is rare in the UK today, because most children get a vaccine [VAX-EEN] to protect them from the bacteria. The milk we drink is pasteurised [PAS-CHER-EYES-D], so bacteria are killed off. TB is still a big problem in countries like Africa, where it infects people with HIV AIDS, who have low immunity [IM-YOON-IT-EE]. 100 years ago, lots of people in the UK died from TB. There were no antibiotics and no vaccines. Doctors tried extreme things like deflating the lung of a patient to 'let it rest'

Scientist Card

Patient Game: Scientist Card for Heart Disease

There are many different causes of heart disease, for example genetics, smoking, fatness, lack of exercise and stress. The main problem is that arteries [OUR-TER-EES] get clogged with stuff. Cholesterol [CO-LESS-TUR-OL], fatty material and cells can build up on blood vessel walls, making it more difficult for blood to flow. This can lower the amount of oxygen [OX-EE-JEN] reaching the heart and tissues, so it gets harder to breathe and move around. Treatment ranges from drugs called statins (to lower blood cholesterol) to surgery (heart bypass operations)



In the past, it was thought that sugar caused heart disease

Heart disease was one of the leading causes of death 100 years ago. Today, it is still the main cause of death in the UK and across the world. Men over the age of 60 are most at risk. People with heart disease may suffer a stroke or heart attack. Disease is less likely to occur in people who have a healthy balanced diet, and people who don't smoke and aren't overweight

Scientist Card

Doctor's Card (Side 1)

Examine the patient by asking them about what's wrong with them, and by observing their behaviour. Ask them questions and match their signs and symptoms to the correct problem. Then tell the scientists. Once they have advised you of the cause, you should look at treatment options and communicate these to the patient

RICKETS SYMPTOMS

Bone pain or tenderness

Dental problems

Muscle weakness

Bent legs

Low blood calcium

Soft skull

Widening of wrist

Risks: rickets is not fatal, but if untreated bones can become severely deformed causing disability

SCURVY SYMPTOMS

Swollen gums

Pain in joints

Short of breath

Fever

Diarrhoea

Weakness

Bruises on legs

Redness on cuts

Risks: if not treated, heart can bleed inside body and cause sudden death

TYPHOID [TIE-FOY-D] FEVER

Fever

Heart rate slow

Headache

Cough

Rose spots chest

Swollen belly

Diarrhoea

Gurgling belly

Muttering

Risks: bleeding inside and burst bowels can cause death if treatment is late

Doctor's Card (Side 2)

TB = TUBERCULOSIS [CHEW-BUR-CUE-LO-SIS] SYMPTOMS

Fever

Chills

Night sweats

Loss of appetite

Weight loss

Tiredness

Blood in mucus from lungs

Risks: if untreated can be fatal, can spread from lungs to other body parts e.g. brain, where it can cause swelling

HEART DISEASE

Chest pain

Pain in one or both arms

Pain in jaw, neck, shoulder

Shortness of breath

Dizziness

Fast heartbeat

Feeling sick to the stomach

Tiredness

Risks: if blood vessels get blocked a heart attack or stroke can happen, which could be fatal

MEASLES

Fever

Runny nose

Cough

Red eyes / sensitive to light

Grey white spots in mouth

Rash of red / brown spots on body

Risks: causes death in a small number of cases, in young children or patients who have low immunity

Thank you

This comic was developed thanks to research and ideas from Kiki von Glasow and Andree Molyneux. Thanks also to Professor Amanda Fisher for helping shape the stories and game. **Heroes of Health: 2013** was designed and produced by the Public Engagement, Media & Grants Facility at the MRC Clinical Sciences Centre, and funded by the Medical Research Council in celebration of its hundredth birthday.

Happy birthday MRC!


COD
LIVER