

Parkinson's Disease

Part 1 Role play

Time: 2 hours

Introduction

This activity is a role play exercise involving the people likely to be most affected when someone is diagnosed with Parkinson's disease. Teachers should be sensitive to the likelihood that some students will be personally affected by Parkinson's disease in a family member or friend.

The activity

Each student should be assigned (or choose) a role. They should then research the facts for questions relevant to their role, using the textbook and websites (see below). The research should take about 30 minutes. The rest of the session is the role play itself. It is suggested that the role play is divided into three successive phases of about 15 minutes involving meetings between:

1. John, Sue, Dr Ahmed, M Jones and Nadia.
2. James, Anne, Fred and Jerry.
3. Dr Ahmed, Mr Jones and Mrs Rice.

Those not taking a role are observers and should take notes. At the end of each role play the observers could have the opportunity to ask questions to specific members of the role play group. Informal discussions are likely to arise and the teacher should use their judgement about if and when to intervene.

Make sure there is time for a discussion of the implications of Parkinson's out of role afterwards. The students could be asked to write a summary of the role play exercise afterwards.

See advice on running a [role play](#) under Teaching and Learning

How Science Works

Ge Several factors can influence a person's willingness to accept a specific risk. Most people are more willing to accept a process or situation that has some risk if they get direct benefit from it, and if they choose it voluntarily rather than having it imposed.

Hf Decision makers are influenced by the mass media, by special interest groups and by public opinion as well as by expert evidence. Decisions about science and technology may be influenced by decision makers' prior beliefs or vested interests, which can affect their interpretation and evaluation of the evidence.

Science explanations

Jd A chemical transmits the signal across the junction between two neurons (synapse). Examples of these chemical transmitters (neurotransmitters) are acetylcholine, dopamine and serotonin. Some neurotransmitters strengthen signals, others inhibit them.

Je Dopamine is involved, amongst other functions, in the transmission of signals related to movement and emotional responses.

Jh Most drugs that influence brain function work by changing levels of neurotransmitters. Two of the ways they may do this are by mimicking neurotransmitters or by affecting their reuptake at synapses. For example; nicotine mimics acetylcholine, anti-depressants inhibit serotonin uptake. All drugs (medical and recreational) that affect the brain have some undesirable side-effects.

Resources

Internet access
Lapel badges for names

The roles

John, aged 50, has just been told he has Parkinson's disease. He is a computer expert who visits companies and homes by car. He is married with two children. He is a keen member of his village cricket team.

Sue, John's wife, is a teacher in the local primary school.

James, 15, is their son.

Anne, 12, is their daughter.

Fred is John's boss.

Nadia is the area Parkinson's nurse.

Jerry is John's friend in the cricket team.

Dr. Ahmed is John's GP.

Mr. Jones is the Parkinson's consultant at the local hospital.

Ms Garcia is a financial adviser.

Mrs. Rice is a representative of a pharmaceutical company doing clinical trials of a new Parkinson's drug.

Observers these can be considered as trainee Parkinson's support nurses

Part 2 Video of Parkinson's disease patient Mike Robins

Students are asked to watch a website showing a video clip of Parkinson disease patient Mike Robins, explaining how electrodes implanted in his brain help to control his tremors. He demonstrates what happens when the device is turned off and then turned on again. The technique is known as deep brain stimulation (DBS). You may wish to remind them of the LSS skills on watching a film that they may have worked on at AS level.

<http://www.youtube.com/watch?v=KDjWdtyz51>

Answers

1. Explain why this patient benefits from the implanted electrodes.
The patient has tremors which are not easily controlled with drugs. These tremors prevent him leading a normal life.
2. Would this operation be beneficial to all PD patients?
No it is not suitable for all PD patients. Most PD patients' tremors can be controlled with drugs, so DBS is unnecessary. Some patients are too frail to withstand such an operation.
3. Give two disadvantages of DBS.
The procedure is costly. There is a high risk of side-effects such as stroke.

4. Explain where in the brain the electrodes are placed. Why are they placed there?
The electrodes are placed deep in the brain on a level with the ears, into a region which controls movement. This movement control region over-reacts because of a lack of dopamine, causing excessive movement. The electrodes reduce brain activity, damping down tremors.
- 5 The procedure was developed through experiments on monkeys.
- (i) Suggest why monkeys were used for the research.
Monkeys were used because they can display Parkinson's – like symptoms, and so can be used to test treatments.
- (ii) Explain why some people object to the use of monkeys in research.
Monkeys are Primates: the same classification group as non-human apes and humans. Because monkeys are closely related to humans, they make good models for testing treatments. However, their close relationship to humans also means that they are highly intelligent, and likely to suffer from laboratory procedures more than other mammals. Moreover, monkeys are highly social animals and suffer if they are kept in the solitary conditions required for some experiments.

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Introduction

This activity is a role play exercise involving the people likely to be most affected when a person is diagnosed with Parkinson's disease. It should help you understand the science and some of the social consequences of the disease.

The roles

John, aged 50, has just been told he has Parkinson's disease. He is a computer expert who visits companies and homes by car. He is married with two children. He is a keen member of his village cricket team.

Sue, John's wife, is a teacher in the local primary school.

James, 15, is their son.

Anne, 12, is their daughter.

Fred is John's boss.

Nadia is the area Parkinson's nurse.

Jerry is John's friend in the cricket team.

Dr. Ahmed is John's GP.

Mr. Jones is the Parkinson's consultant at the local hospital.

Mrs. Rice is a representative of a pharmaceutical company doing clinical trials of a new Parkinson's drug.

Observers who are trainee Parkinson's support nurses

The activity

When you have chosen or been assigned a role you need to research some facts to help you answer questions in role. Use the textbook and websites (see below). The research should take about 30 minutes. Make notes as you go along to bring to the role play. You may find interesting and relevant questions and information beyond those suggested below. The rest of the session is the role play itself. It will be divided into three successive phases of about 15 minutes each involving meetings between:

1. John, Sue, Dr Ahmed, M Jones and Nadia - to discuss the diagnosis and the medical support available.
2. John, Sue, Anne, James, Fred and Jerry – to discuss how far John's normal life can be maintained and the social support they can give.

3. Dr Ahmed, Mr Jones, Nadia and Mrs Rice – to discuss the possibility of enrolling John in a clinical trial of a new drug.

It is not entirely probable that all of these people would meet in the exact combinations suggested but they would all be involved in discussing John's health.

Role players and observers should make notes during the session to help with writing a summary of the discussion afterwards.

Possible questions and concerns

John How definite is the diagnosis? Could there have been a mistake? Will it shorten my life? For how long will I be able to drive a car, use a keyboard and carry on working? How well can the disease be controlled? Do the drugs have side effects? Will it affect my mental abilities?

Sue What problems will John face in day-to-day life at home? Are there any new drugs which offer a cure? Will our health insurance pay out if he is unable to work?

James Will I need to look after my father in future years if my mother can not cope? Will there be enough money for my university fees?

Anne What can I do to help my parents? What support is there from Social Services for someone with Parkinson's disease. Are my children more likely to get Parkinson's disease if my father has it?

Fred Will John's work be affected? What are the legal and financial implications if John becomes unable to work?

Nadia Explains the role of a Parkinson's nurse. She advises on exercise techniques, diet and local support groups. She can also provide mobility aids. However, she has a restricted budget and a wide area to cover. She can only visit once a month.

Jerry Offers to run a charity cricket match for John's benefit, but wonders if John would prefer his condition to be kept confidential.

Dr. Ahmed Explains that no two people's experience is the same: drugs affect people in different ways and different treatments will need to be tried. He is not in favour of participating in clinical trials or of deep brain stimulation, and prefers to stick to tried and tested treatments.

Mr. Jones Has about 20 Parkinson's patients on his list. He sees each one every 6 months to review progress and the effects of treatment. He would like to try John on a new drug that has just completed clinical trials, and is thought to be especially good with people like John who develop the disease relatively young.

Mrs Rice Has provided literature and data on clinical trials for the new drug that Mr Jones is proposing to prescribe to John. Mr. Jones receives extra funding for his private clinic from the drugs company.

If you are an **observer** imagine you are attending the meeting as a **trainee Parkinson's support nurse** and make notes on what you learn that might be useful in your future role. This could include both technical and social information but also good and bad ways of approaching the issues with those most affected.

Sources

<http://www.parkinsons.org.uk>

Website of charity Parkinson's Disease Society

<http://news.bbc.co.uk/1/hi/health/7583657.stm>

Results of trials of new Parkinson's drug

<http://www.michaeljfox.org/index.cfm>

Michael Fox Foundation for Parkinson's research

<http://www.nhsdirect.nhs.uk/articles/article.aspx?articleId=278>

NHS Direct

<http://www.epda.eu.com/>

European Parkinson's Disease Association

Part 2 Video of Parkinson's disease patient Mike Robins

This video clip shows Parkinson disease patient Mike Robins explaining how electrodes implanted in his brain help to control his tremors. He demonstrates what happens when the device is turned off and then turned on again. The technique is known as deep brain stimulation (DBS).

<http://www.youtube.com/watch?v=KDjWdtyz51>

Watch the video clip then answer the following questions:

1. Explain why this patient benefits from the implanted electrodes.
2. Would this operation be beneficial to all PD patients?
3. Give two disadvantages of DBS.
4. Explain where in the brain the electrodes are placed. Why are they placed there?
5. The procedure was developed through experiments on monkeys.
 - (i) Suggest why monkeys were used for the research.
 - (ii) Explain why some people object to the use of monkeys in research.