



King Saud University  
College of Medicine  
Department of Medical Education

**“ ...I HAVE  
TREMOR”  
TUTORIAL TWO**

YEAR TWO, NERVOUS SYSTEM BLOCK

**Curriculum Development Unit**  
**STUDENT'S CASE**  
**CASE 3; 2013**

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The Template of the PBL Cases and the Tutor Guide is designed (IP): by Professor Samy A. Azer.

The Student Case is created by  
Professor Samy A. Azer  
Dr. Huseyin Cahit Taskiran  
Dr. Muhammad Azhar Chishr  
Dr. Amr S. Moustafa

## Tutorial 2: Discussion of Learning Issues

(60 minutes)

**Students:** You should start by discussing your "learning issues" that you have identified at the end of tutorial one. You might spend about **60 minutes** on this task. A scribe on the whiteboard is needed to help in this process.

Once you have completed the discussion of your "learning issues", you might progress to these questions. Spend about **10 minutes** on discussing them in your group. A scribe on the whiteboard will help in this process.

### Discussion Questions:

- What do you think the cause of Saad's problem is? What are the pathological changes underlying this problem?
- In what way can Levodopa coupled with a peripheral decarboxylase inhibitor help in his treatment?
- What investigations would you like to order for Saad at this stage?
- Do you know a Nobel prize winner whose work has helped in understanding a physiological principle related to this case. Discuss how his/her work helped in advancement of our knowledge in this area.

Five weeks later, Mr. Saad comes to see the neurology consultant. He feels much better. His arm and hand tremor are much less than used to be.

At the end of the consultation the neurologist, who is also a Professor of Neurology at King Saud University discusses with Mr Saad a research project he has been working on. He explains to him, "...this research is a joint project with three international universities. He asks Mr. Saad if he is willing to be part of the research. He explains to him and his son the value of the research for possible new discovers that could help in treating patients with similar condition. He also explains to them what is needed for the research project. He answers Saad's questions. The consultant also shows them that the research has been approved by King Saud University Human Research Committee. Saad agrees to join the research project as a volunteer. He signs the consent forms required and receives copies of papers explaining the research outline in a simple language and what is required from Saad.

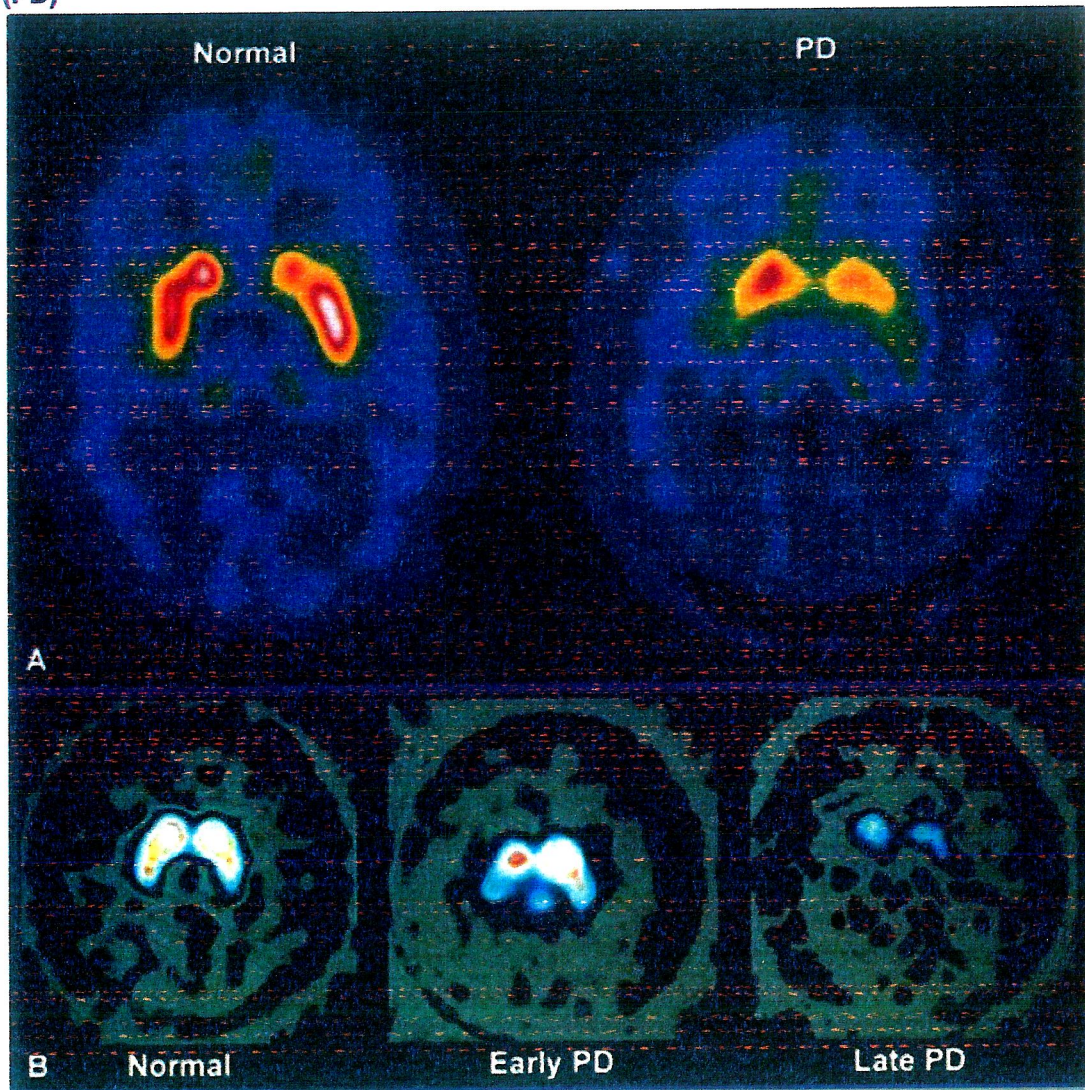
**Discussion Questions:**

- Are there words that you do not understand?
- On the basis of the new information, what is your final hypothesis?
- Why do we need research?
- Why a research project has to be approved by the university human research committee?

The images below are from the research project conducted on patients with Parkinson Disease. Normally such investigations are not needed for the diagnosis of Parkinson disease (PD). As with the case of Mr Saad, Parkinson disease is diagnosed through history and clinical examination findings. Such research projects could help in understand the progression of the disease, the mechanisms by which medications work, and the role of therapy in delaying disease progression.

The images show a reduction in the uptake of  $^{18}\text{F}$  DOPA, and  $\beta$ -CIT Spect uptake by the putamen of patients with Parkinson disease (PD) compared to normal control (Normal). The uptake correlates with the disease progression. Saad's images confirm that he has PD (with approximately 60-80% of dopaminergic neurons are lost).

**$^{18}\text{F}$ DOPA PET AND  $\beta$ -CIT SPECT IMAGES IN NORMAL AND IN A PATIENT WITH PARKINSON DISEASE (PD)**



Source: <http://www.parkinsonsdiseasecme.com/cme-modules/neuroprotection-parkinsons-disease/diagnosis-parkinsons-disease.html>

**REPORT:**

**IMAGES A: [<sup>18</sup>F]DOPA PET UPTAKE IN THE PUTAMEN IS REDUCED IN PATIENTS WITH PD COMPARED WITH NORMAL CONTROLS.**

**IMAGES B: REDUCTION IN  $\beta$ -CIT SPECT UPTAKE IN THE PUTAMEN CORRELATES WITH THE SEVERITY OF PD**

**Discussion Questions**

- Are there words that you do not understand?
- Summarize key information that you have obtained from this progress.
- Construct a mechanism summarizing your final hypothesis with regard to the site of the lesion, the mechanisms underlying Saad's problems. Provide supportive evidence from history, clinical examination and investigation results.

## Case closure:

(10 Minutes)

Over the next 5-6 months Mr Saad shows some improvement. He much less tremor and his walking is more stable. He is also able to do work that needs fine movements such as unbutton his shirt or tie his shoe laces. He regularly see his doctor every 4-5 months.

### Tutor's note:

In the last 10 minutes of the tutorial, you might encourage your group to discuss how they could work better as a group. What are the things they need to change and what things they need to improve? This discussion is very useful and will help the group to function better as they work on the next PBL case.

## Challenging and Revision Questions

**Tutors:** Students could think about these questions on their own as they review the case. They might discuss their answers with their friends.

- Discuss the anatomy and physiology of the basal ganglia?
- What are the mechanisms by which Parkinson disease occurs? In your mechanism discuss the biochemical and molecular changes responsible for the development of tremor, and muscle rigidity (stiffness).
- Discuss the pathology of Parkinson disease.
- Discuss the pharmacology of drugs used in the treatment of Parkinson Disease.

## Learning Objectives:

On completion of this PBL package the students should be able to:

1. Describe structures and function of the basal ganglia and its role in control of fine movements.
2. Describe roles of neurotransmitters (particularly dopamine) in the normal function of basal ganglia and control of fine movements.
3. Discuss the pathology and pathogenesis of Parkinson Disease.
4. Use basic sciences to interpret clinical symptoms and signs of an patient with Parkinson Disease.
5. Discuss the biochemical and molecular mechanisms underlying the development of Parkinson Disease.
6. Discuss the pharmacology of drugs used in treatment of Parkinson disease and the mechanisms by which they work.