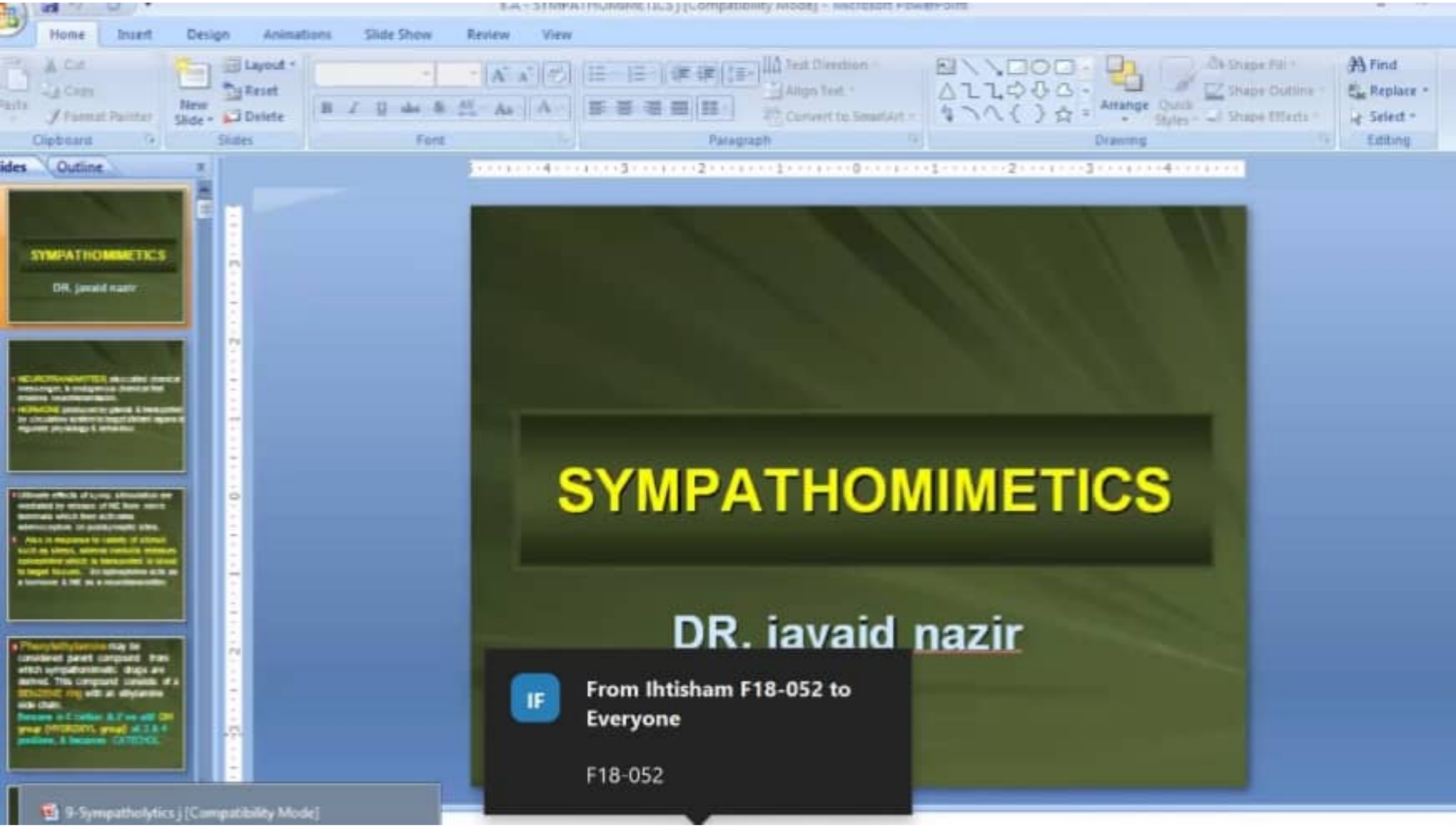
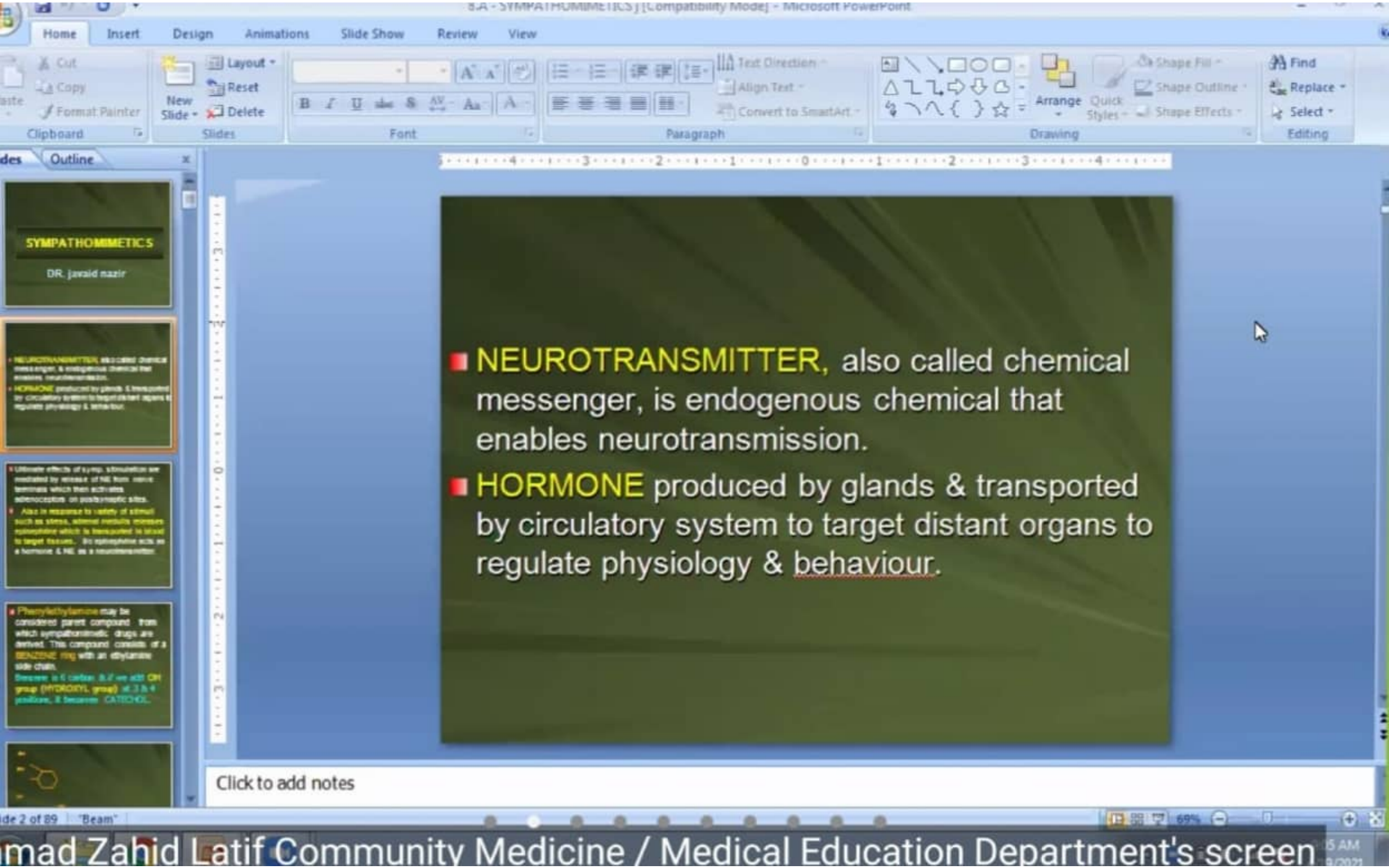
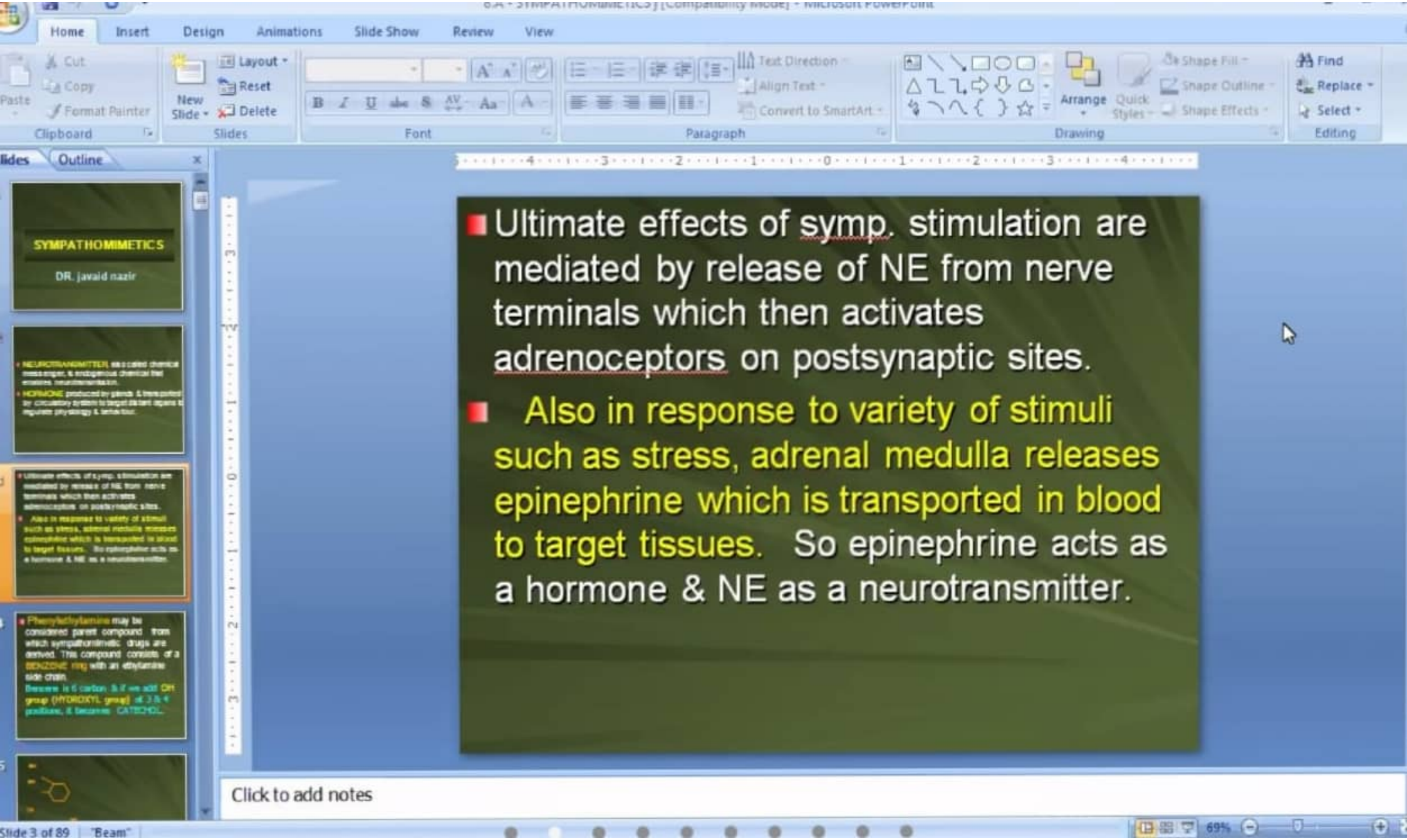
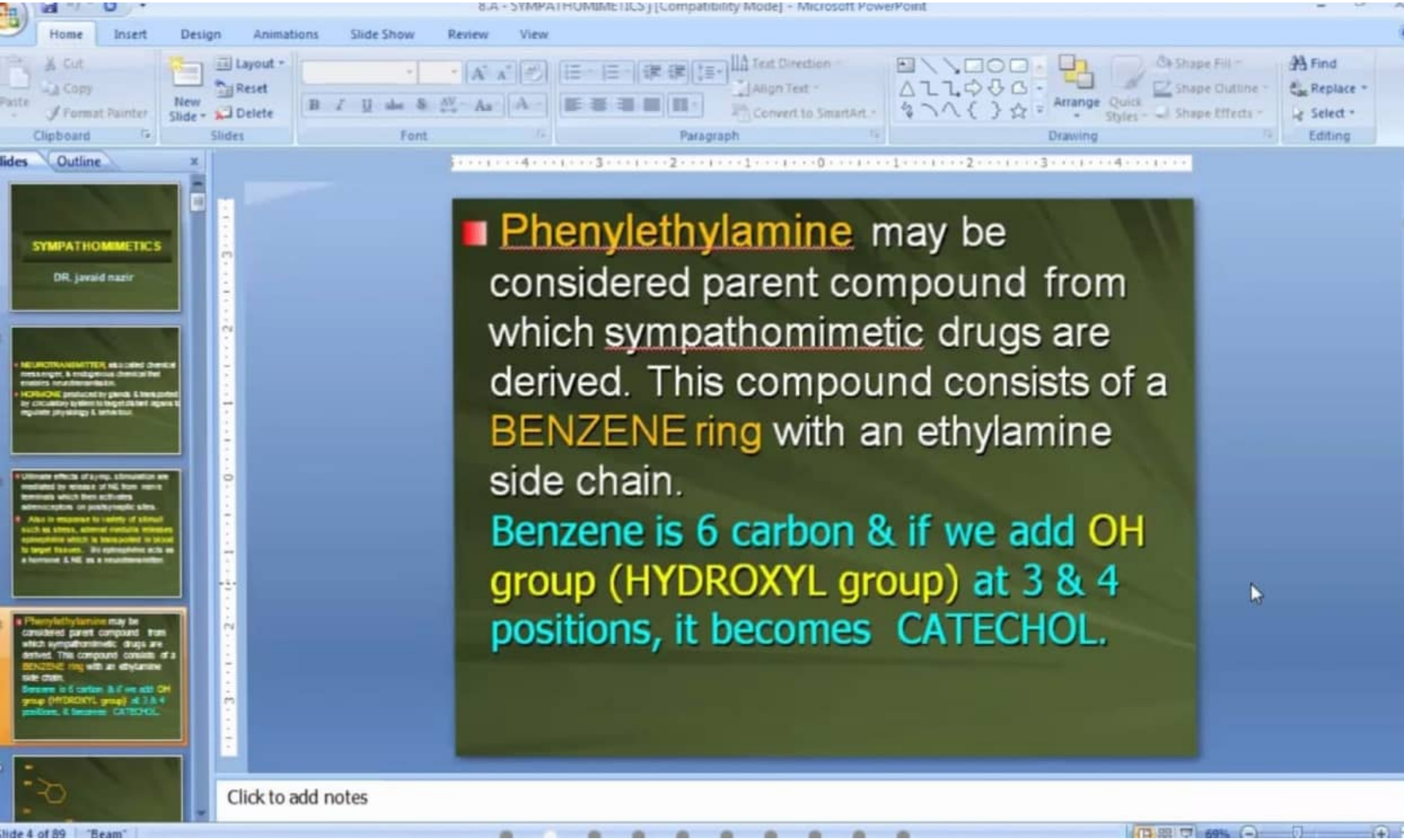
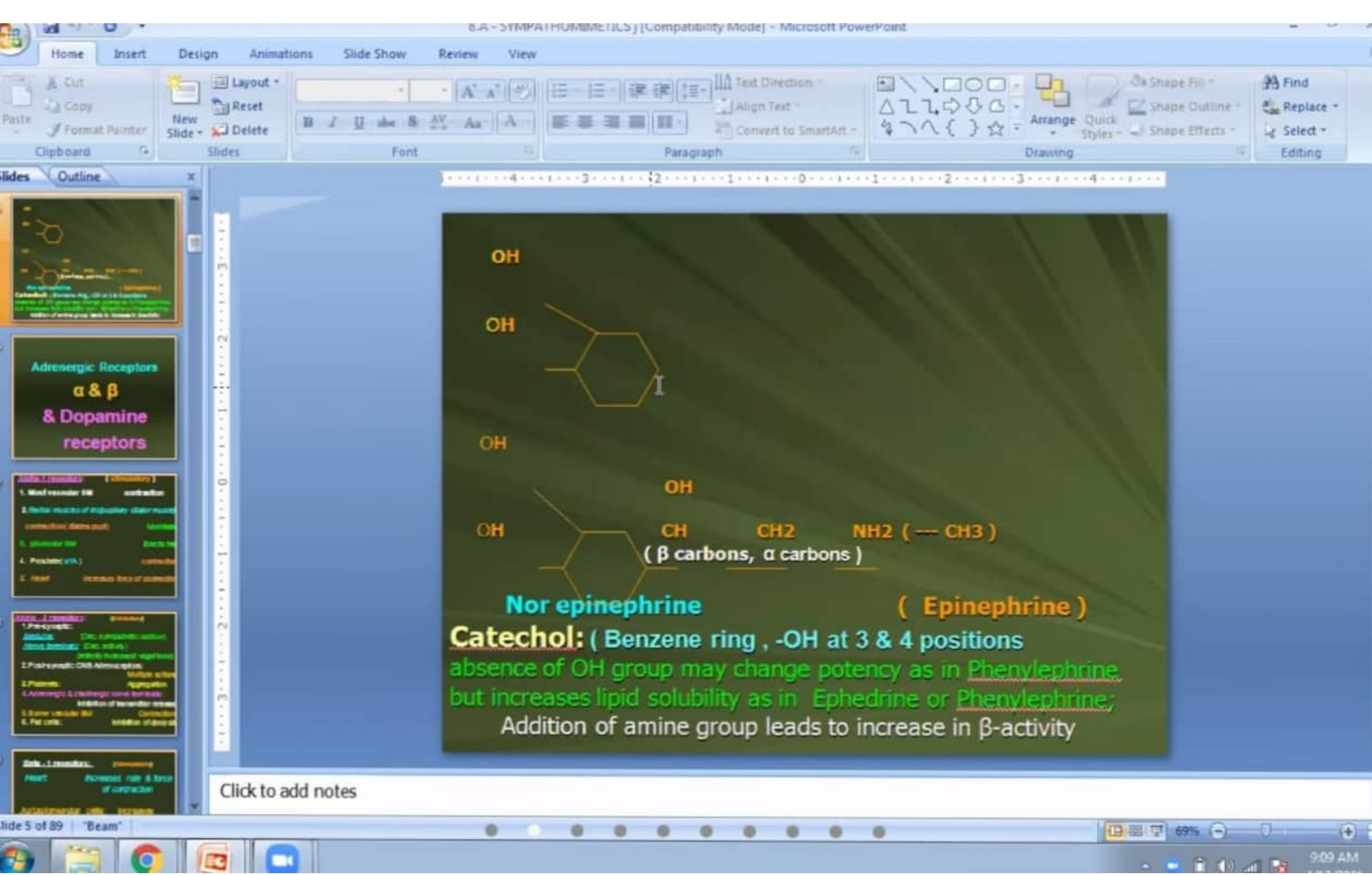
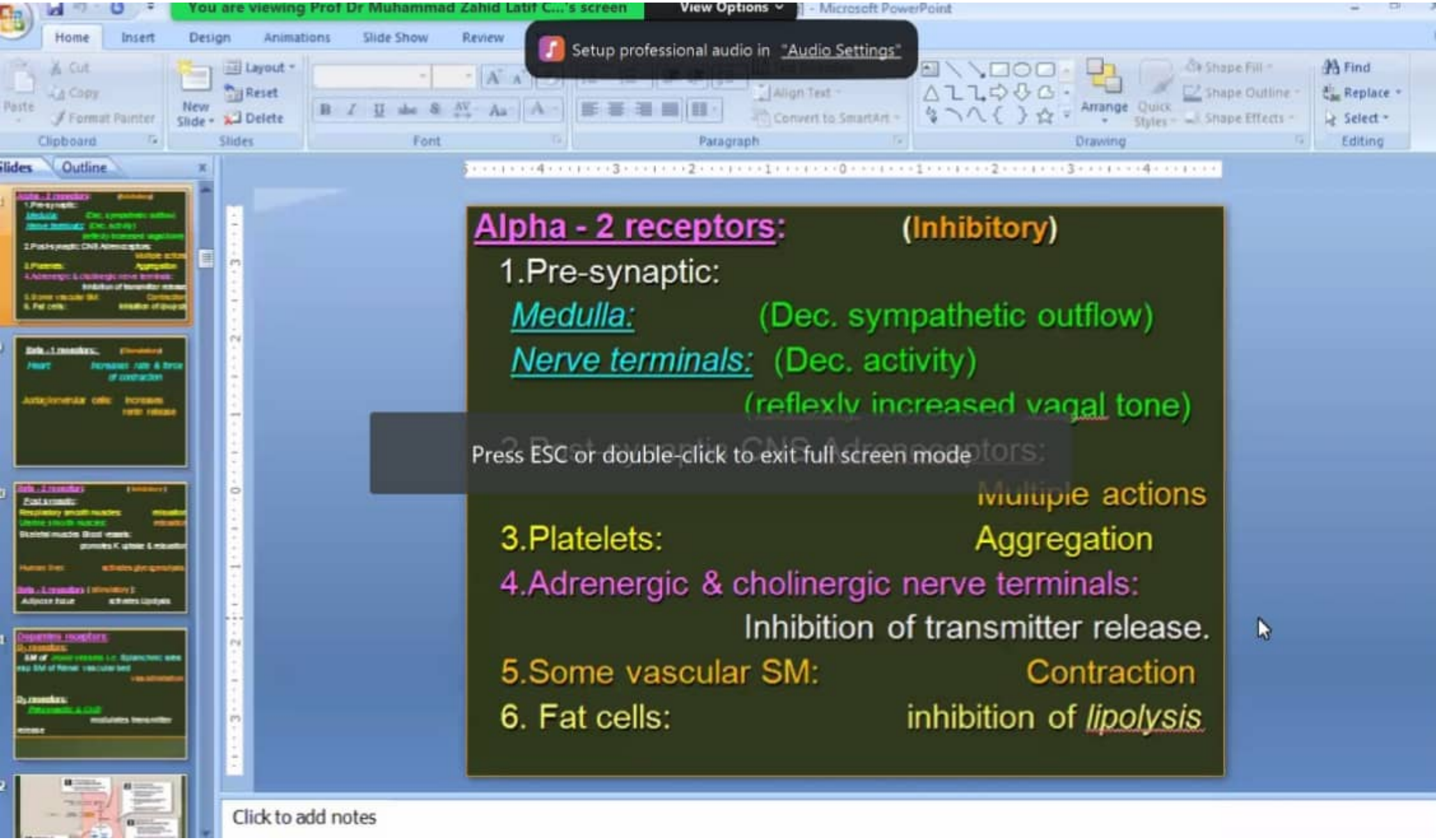


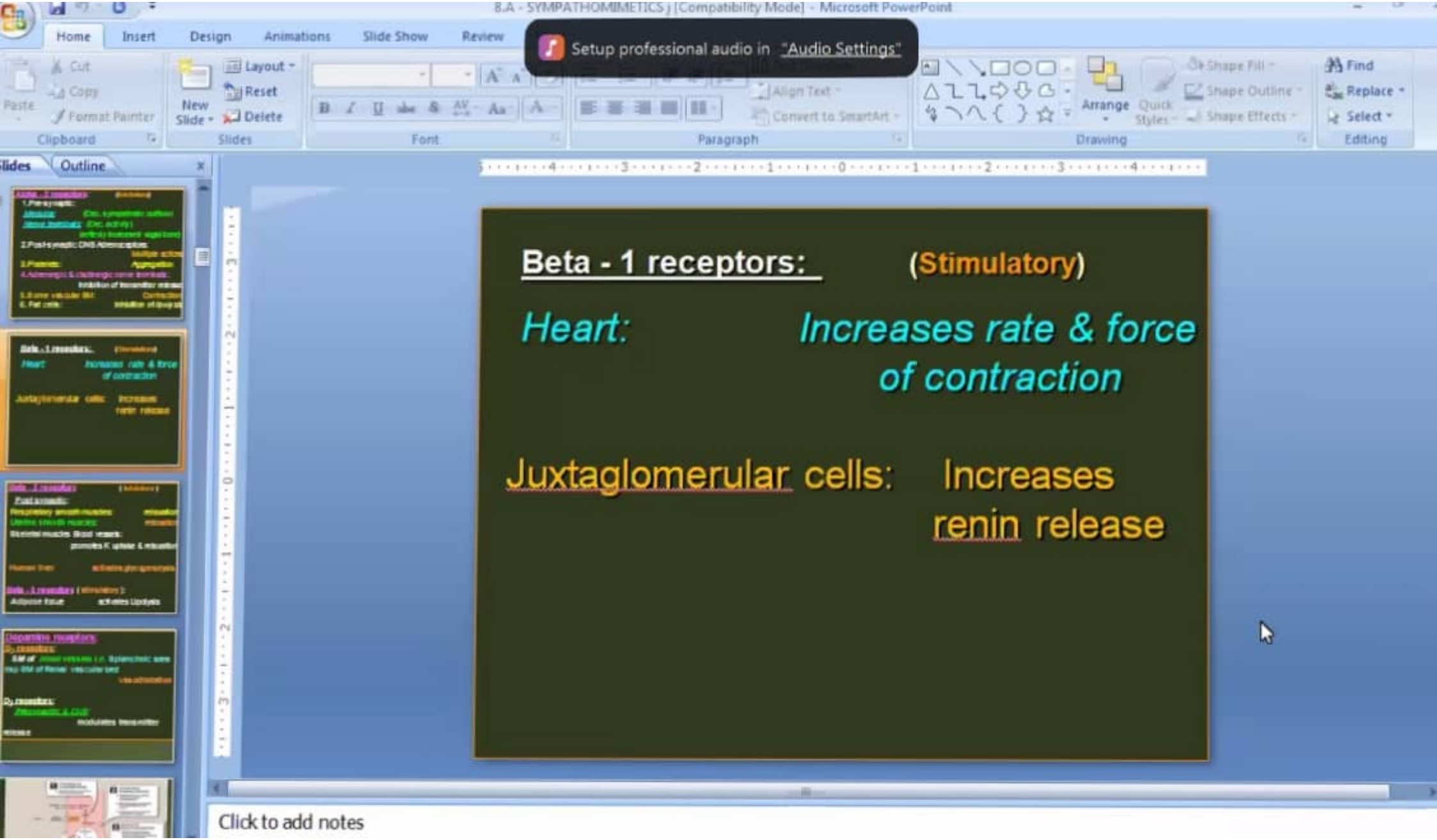


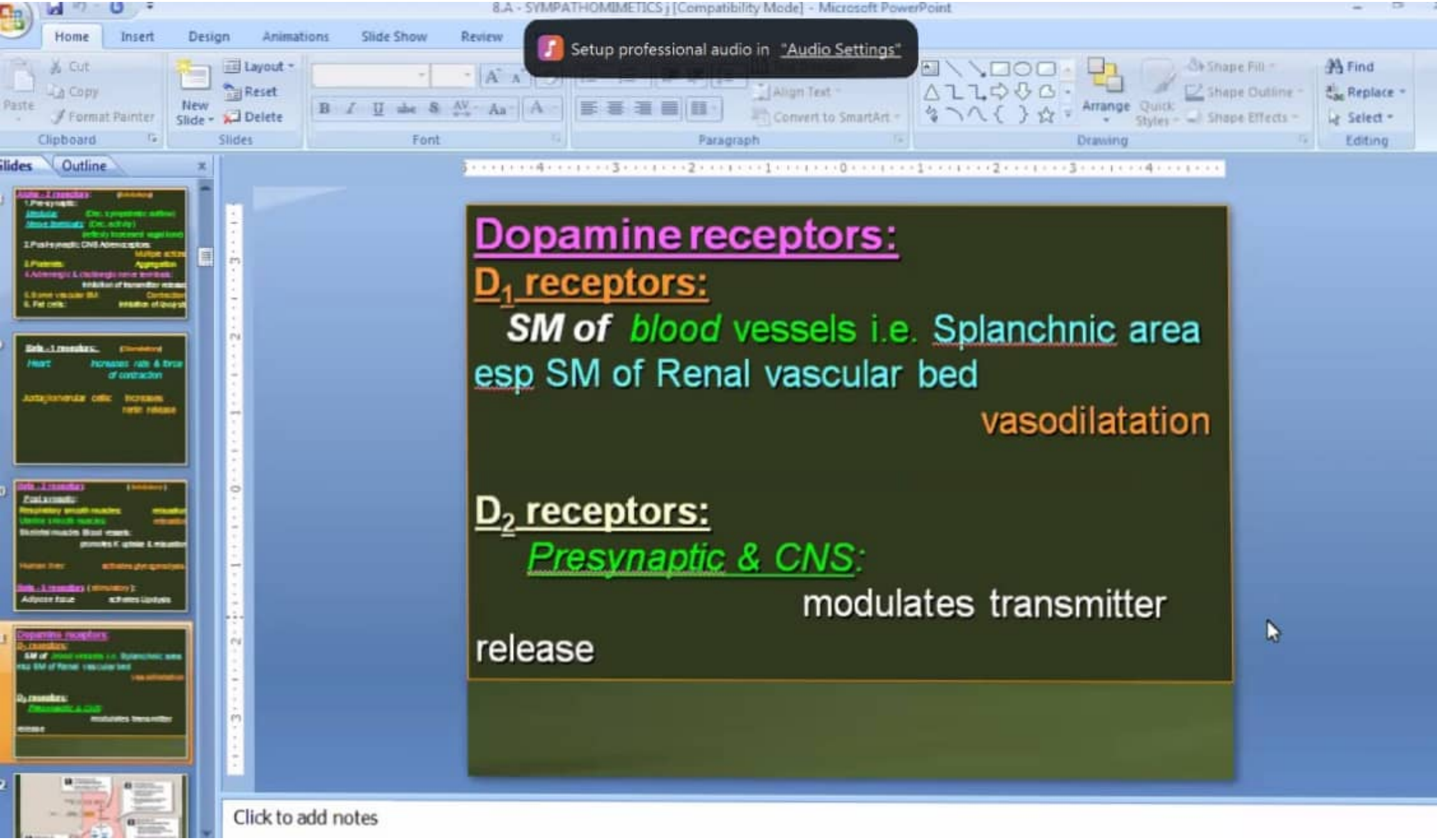


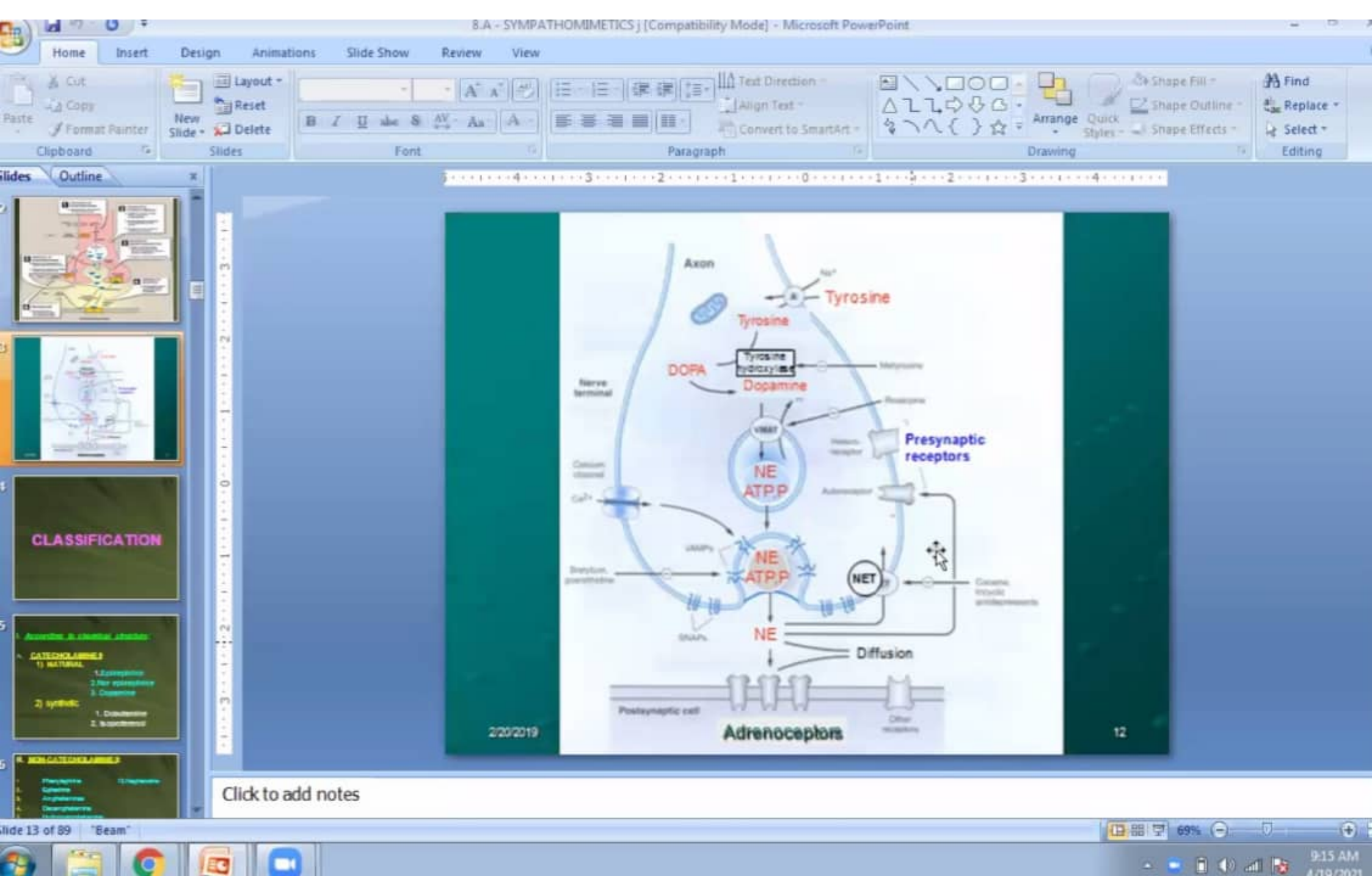


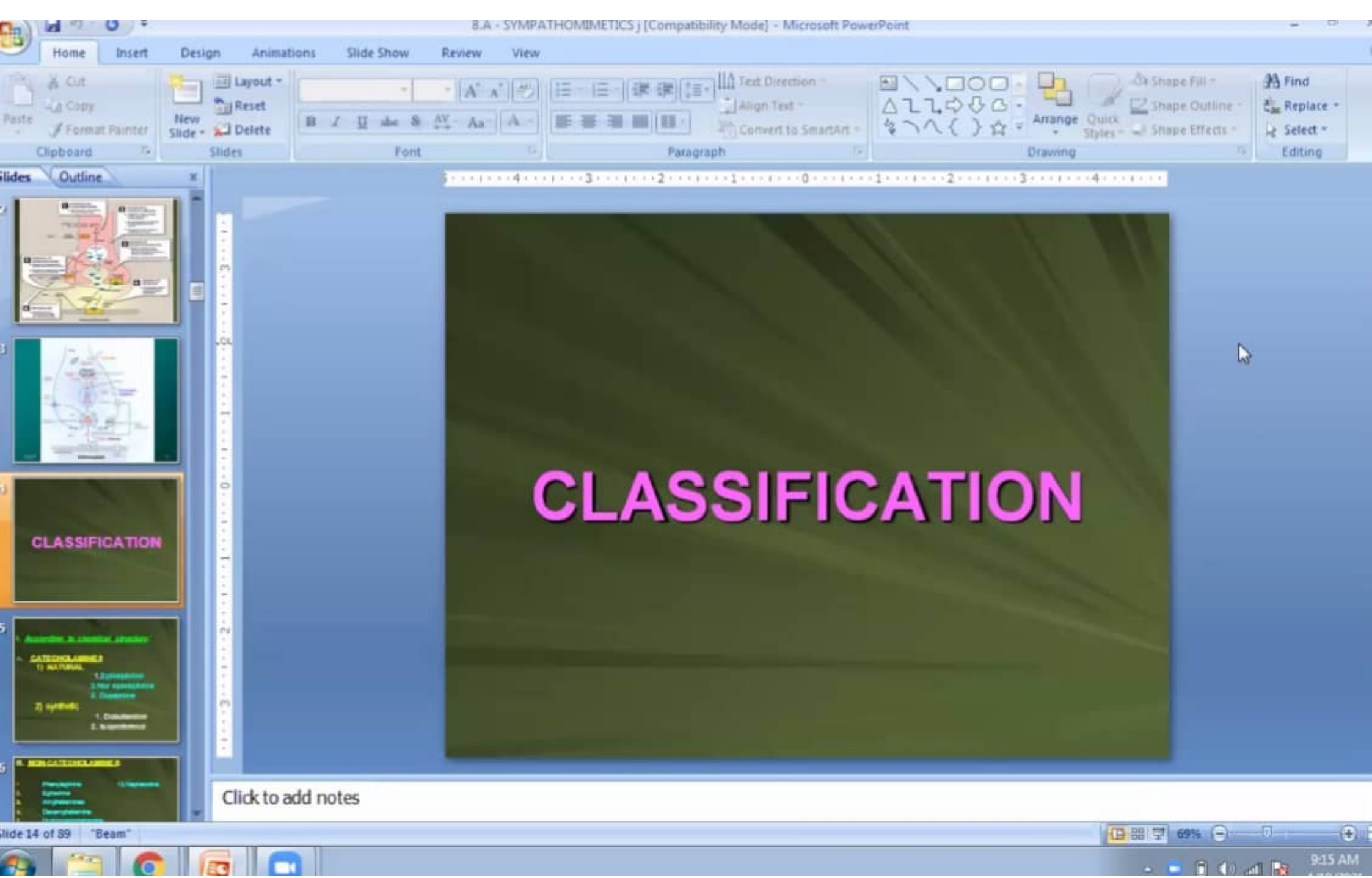












I. *According to chemical structure:*

A. CATECHOLAMINES

1) NATURAL

1. Epinephrine
2. Nor epinephrine
3. Dopamine

2) synthetic

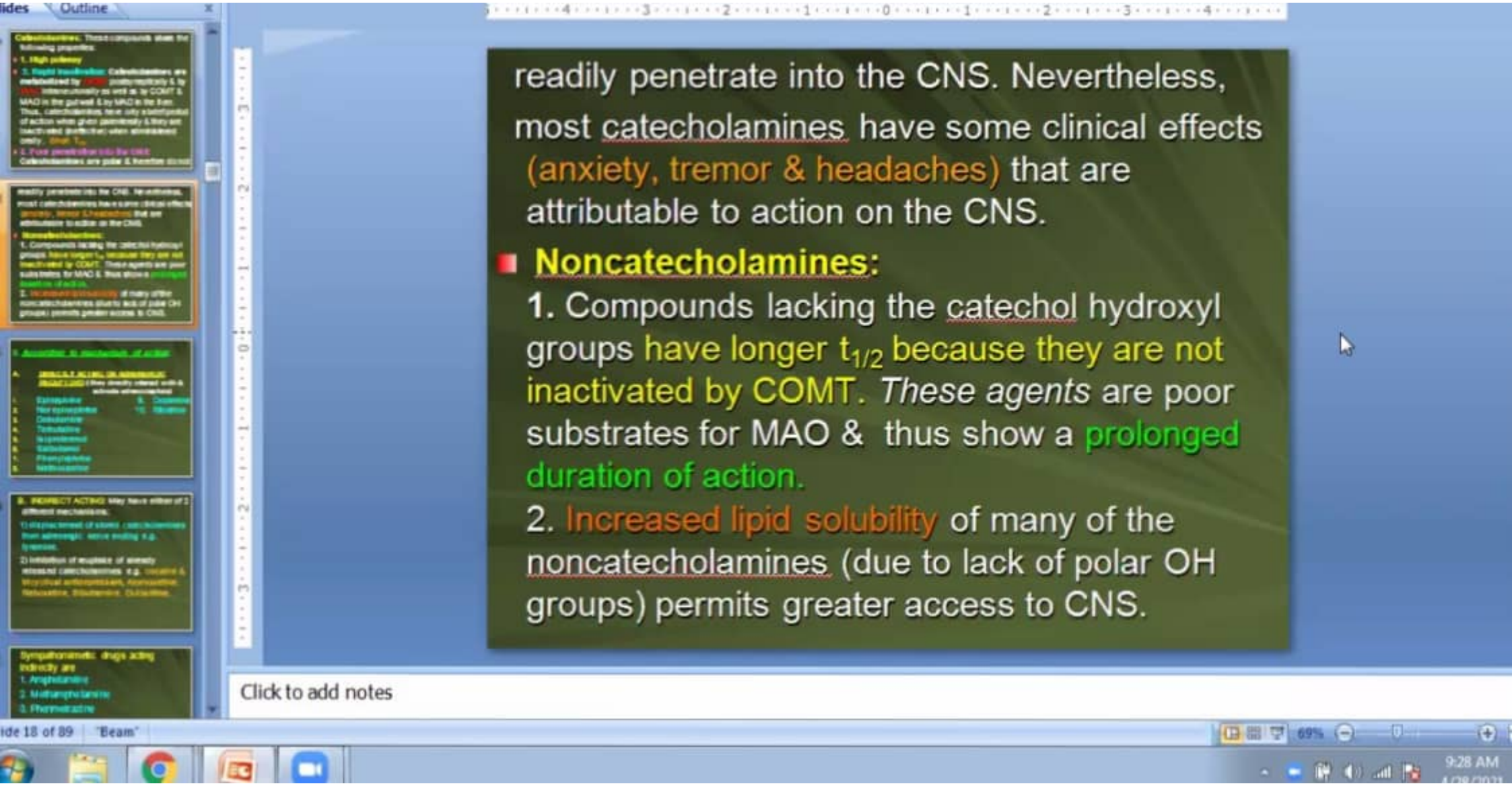
1. Dobutamine
2. Isoproterenol

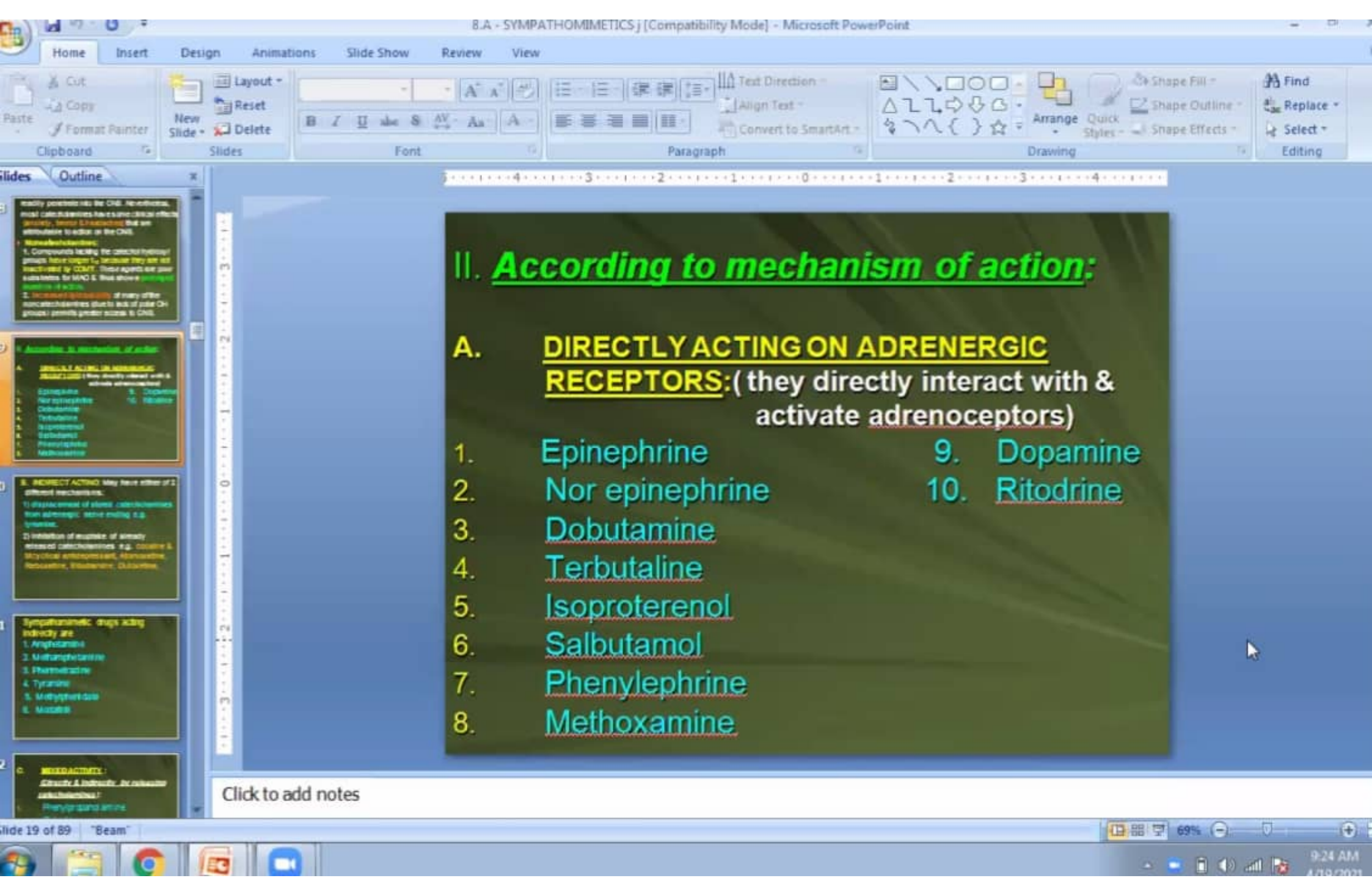
B. NON-CATECHOLAMINES:

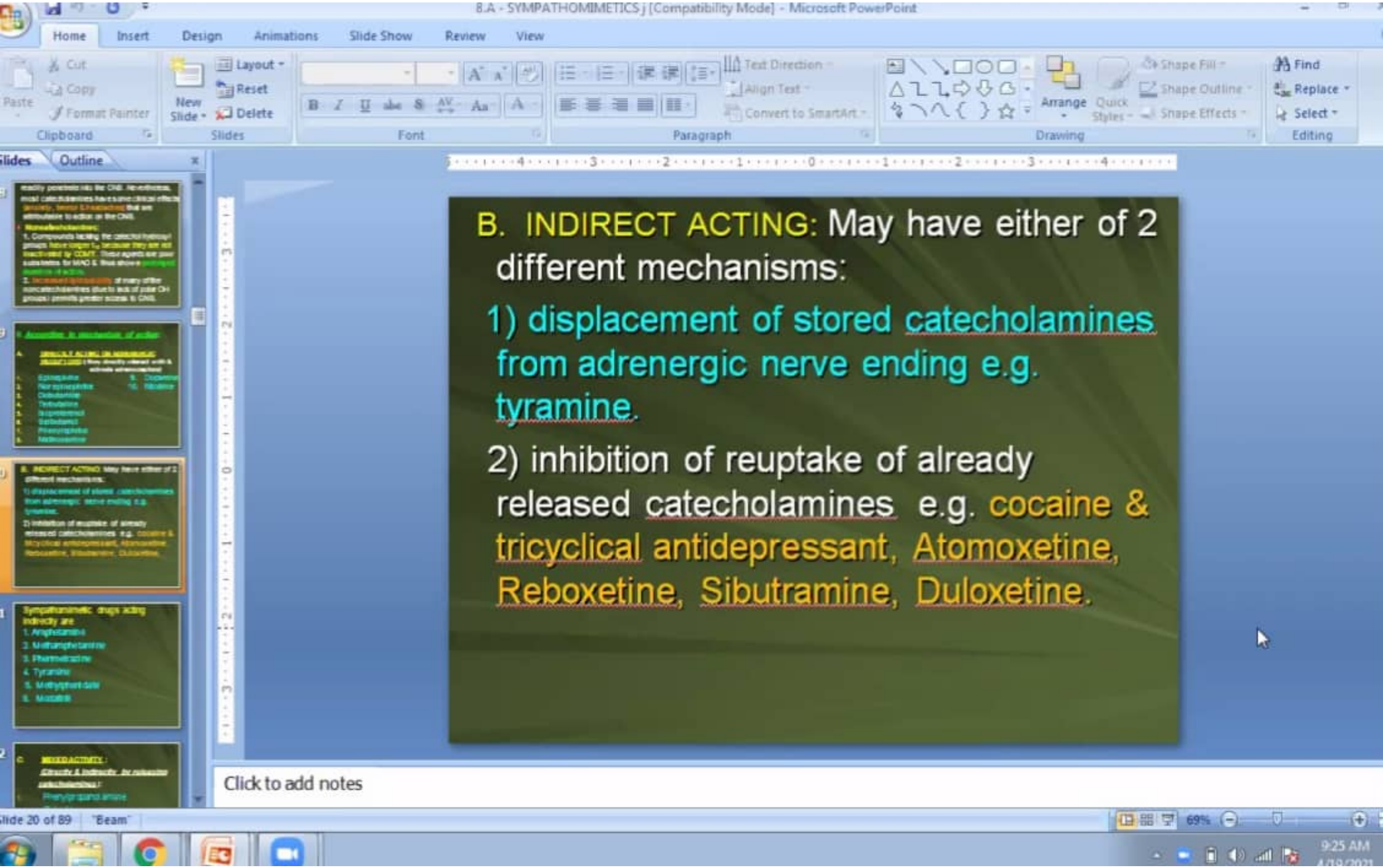
1. Phenylephrine
2. Ephedrine
3. Amphetamines
4. Dexamphetamine
5. Hydroxyamphetamine
6. Methylamphetamine
7. Metaproterenol
8. Salbutamol
9. Terbutaline
10. Methoxamine
11. Phenylpropanolamine
12. Naphazoline

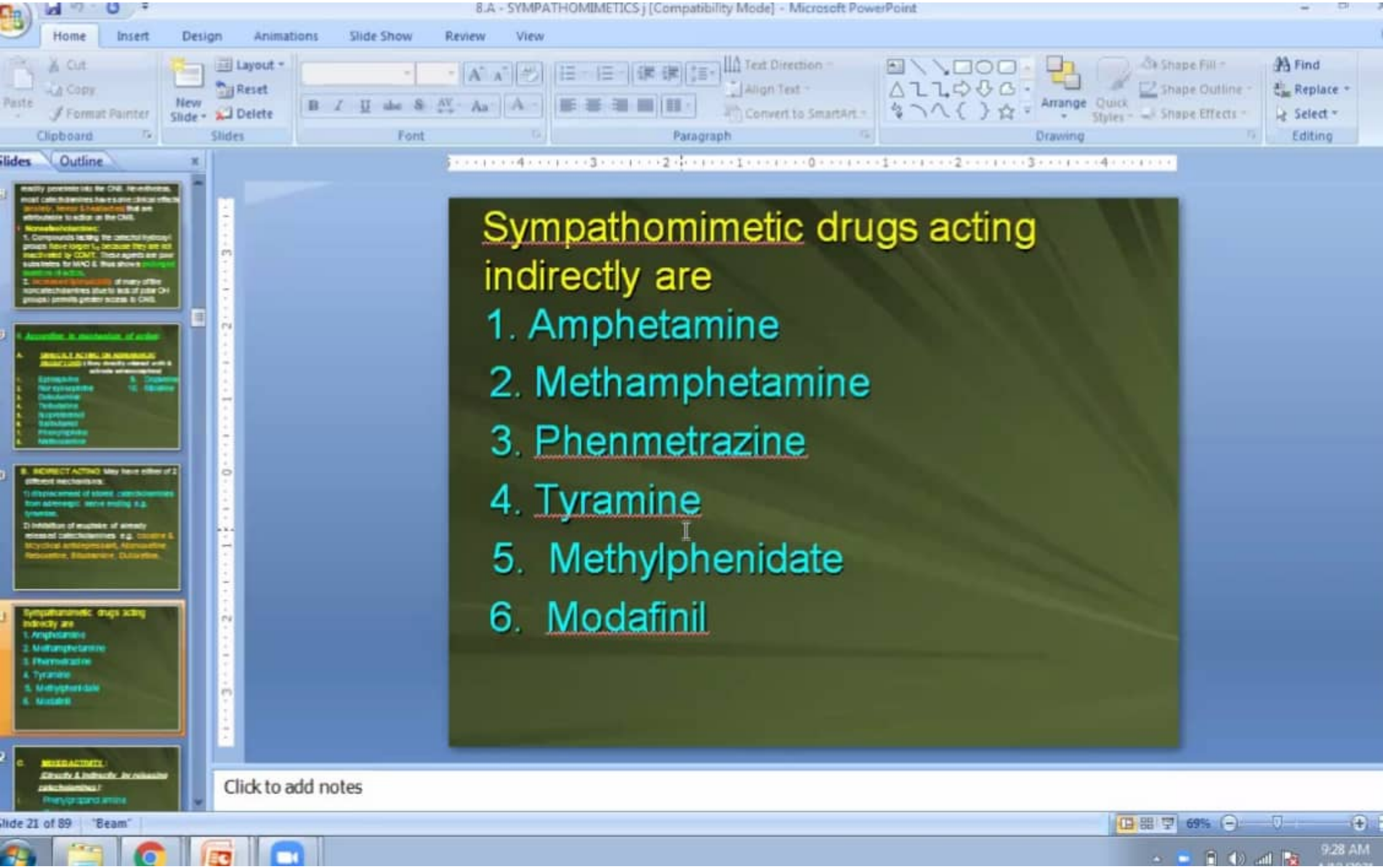
Catecholamines: These compounds share the following properties:

- **1. High potency**
- **2. Rapid inactivation: Catecholamines are metabolized by COMT** postsynaptically & by MAO intraneuronally as well as by COMT & MAO in the gut wall & by MAO in the liver. Thus, catecholamines have only a brief period of action when given parenterally & they are inactivated (ineffective) when administered orally. Short $T_{1/2}$.
- **3. Poor penetration into the CNS: Catecholamines are polar &** therefore do not









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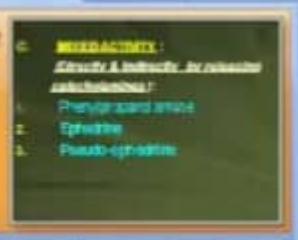
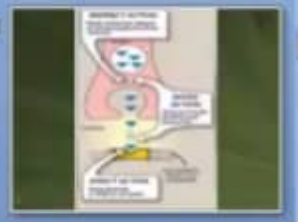
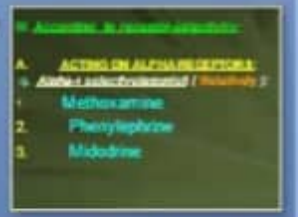
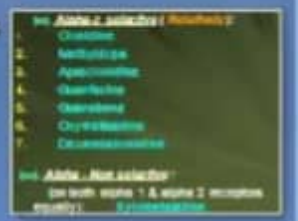








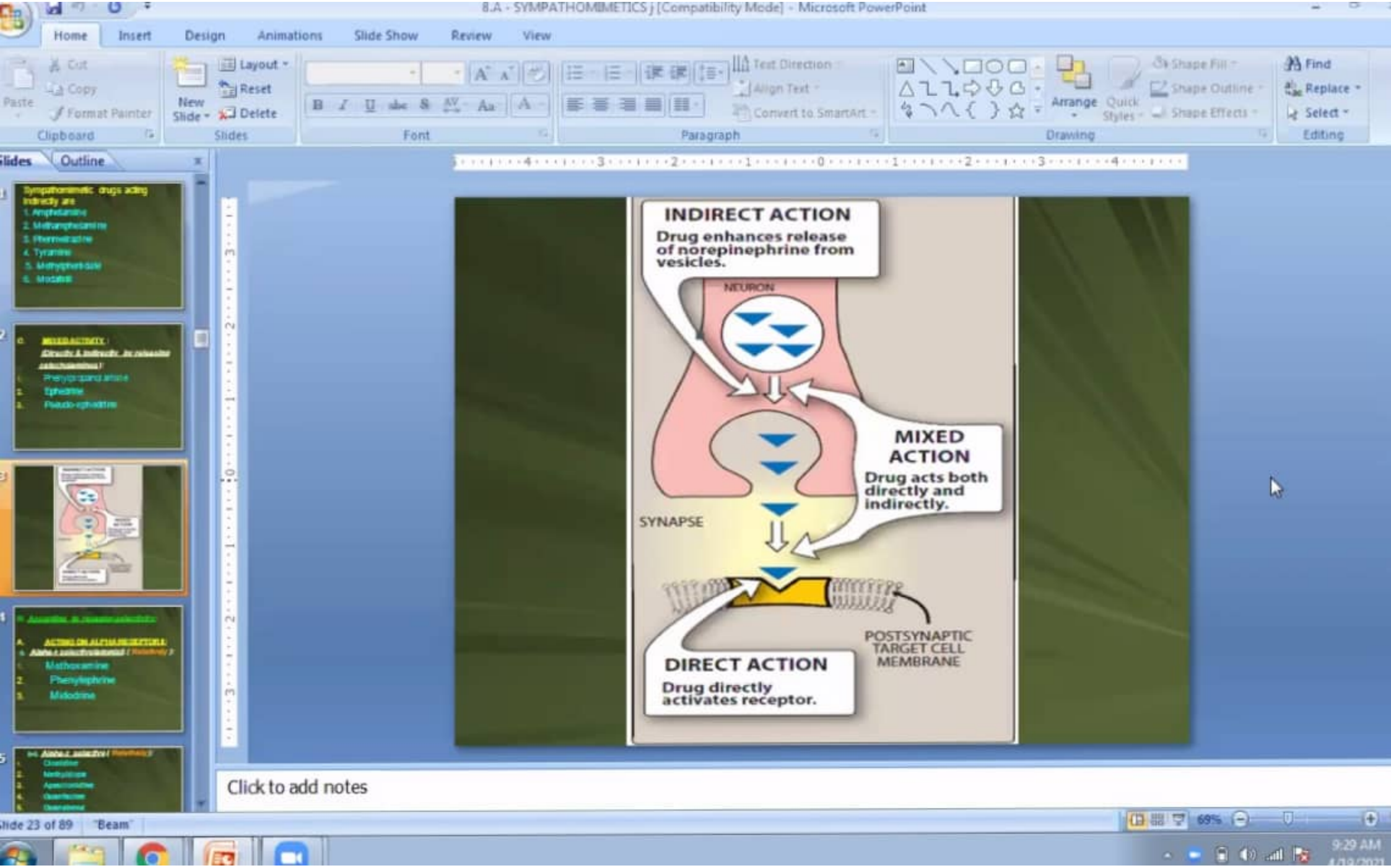
C. **MIXED ACTIVITY :**

(Directly & indirectly by releasing catecholamines):

1. Phenylpropanolamine
2. Ephedrine
3. Pseudo-ephedrine

Click to add notes

Slide 22 of 89 "Beam" 69% 9:28 AM



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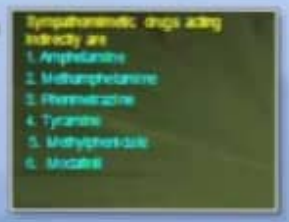
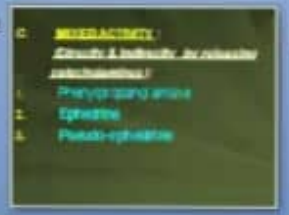




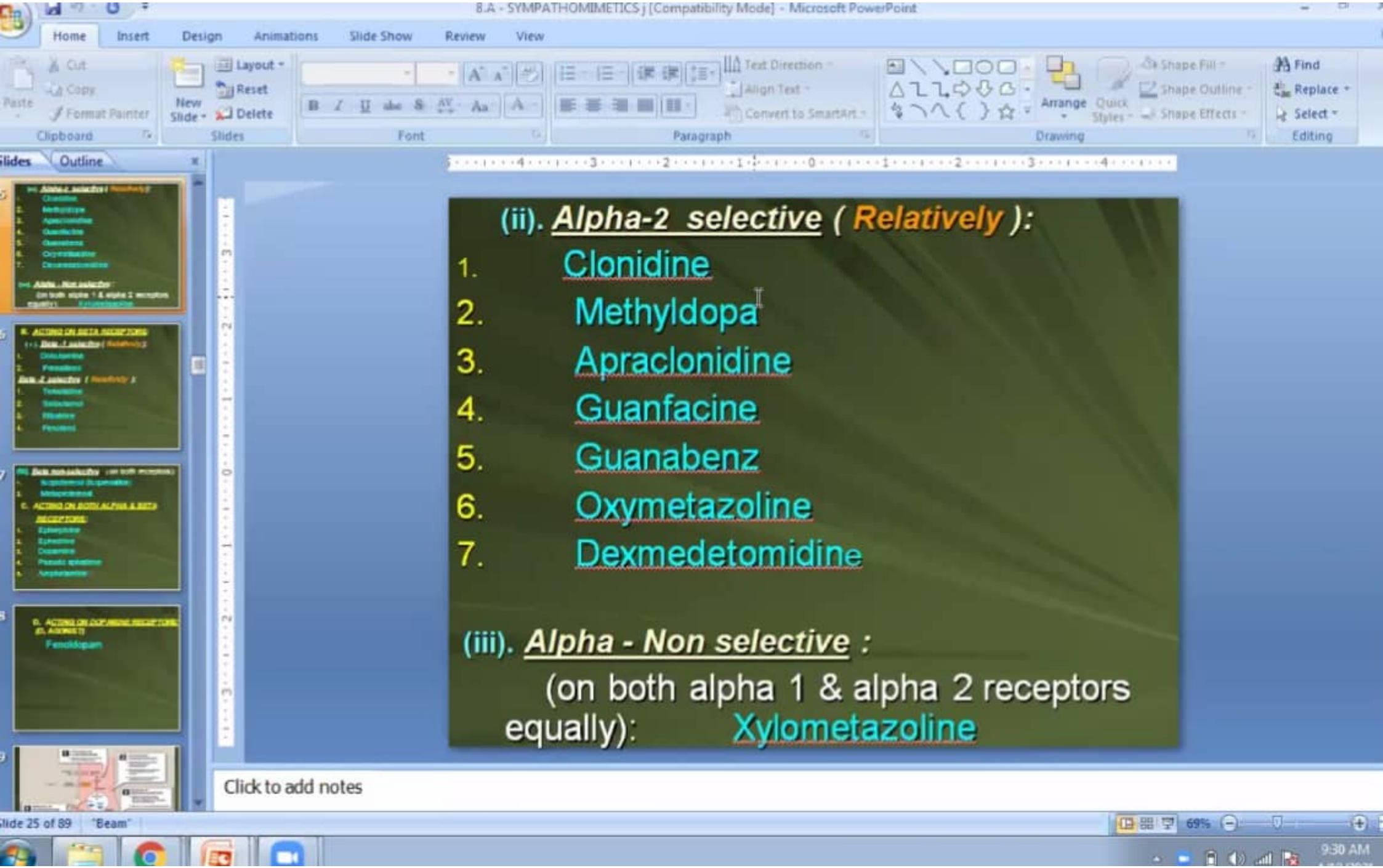
III. According to receptor-selectivity:

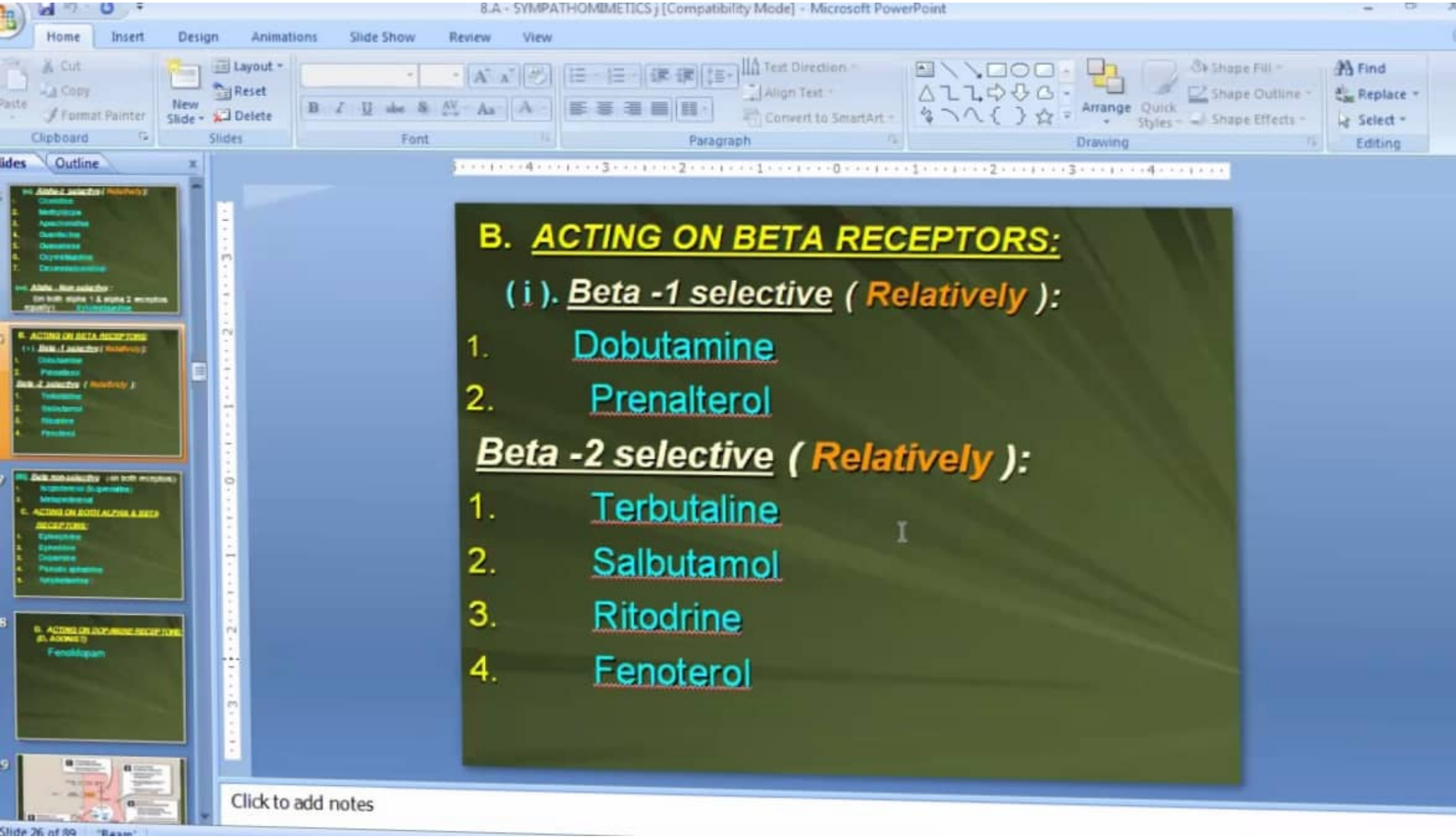
A. ACTING ON ALPHA RECEPTORS:

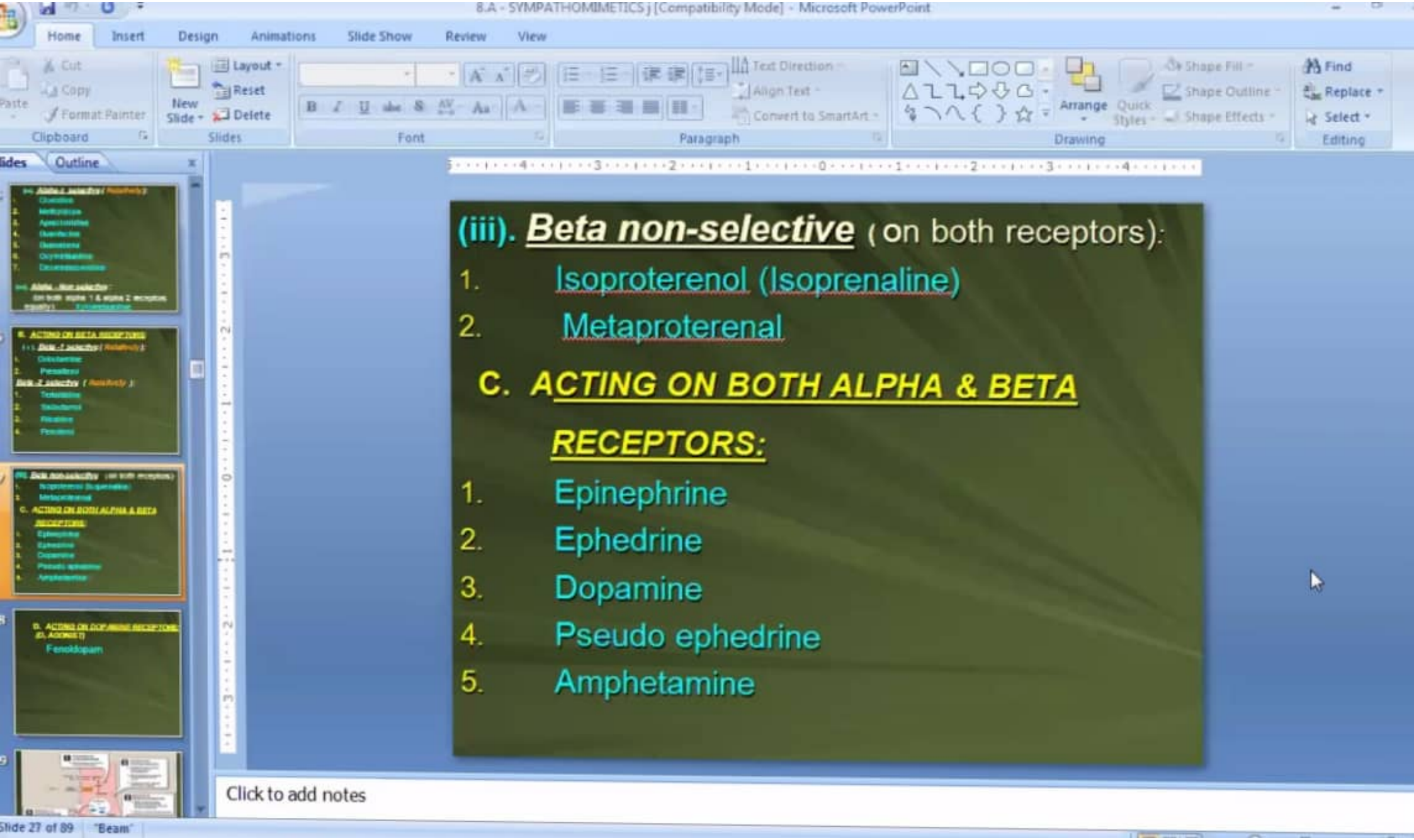
i). Alpha-1 selective(agonist) (Relatively):

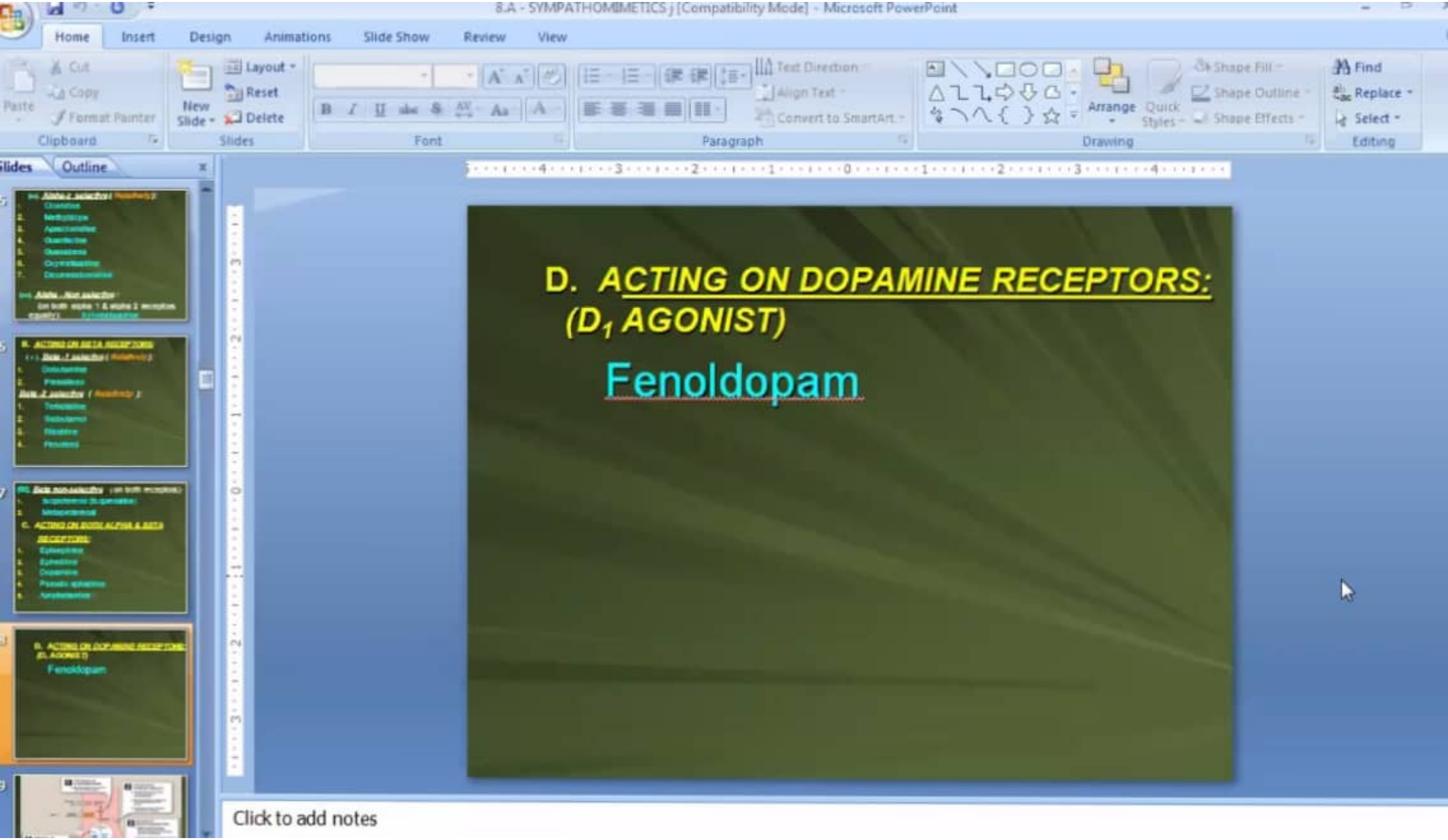
1. Methoxamine
2. Phenylephrine
3. Midodrine

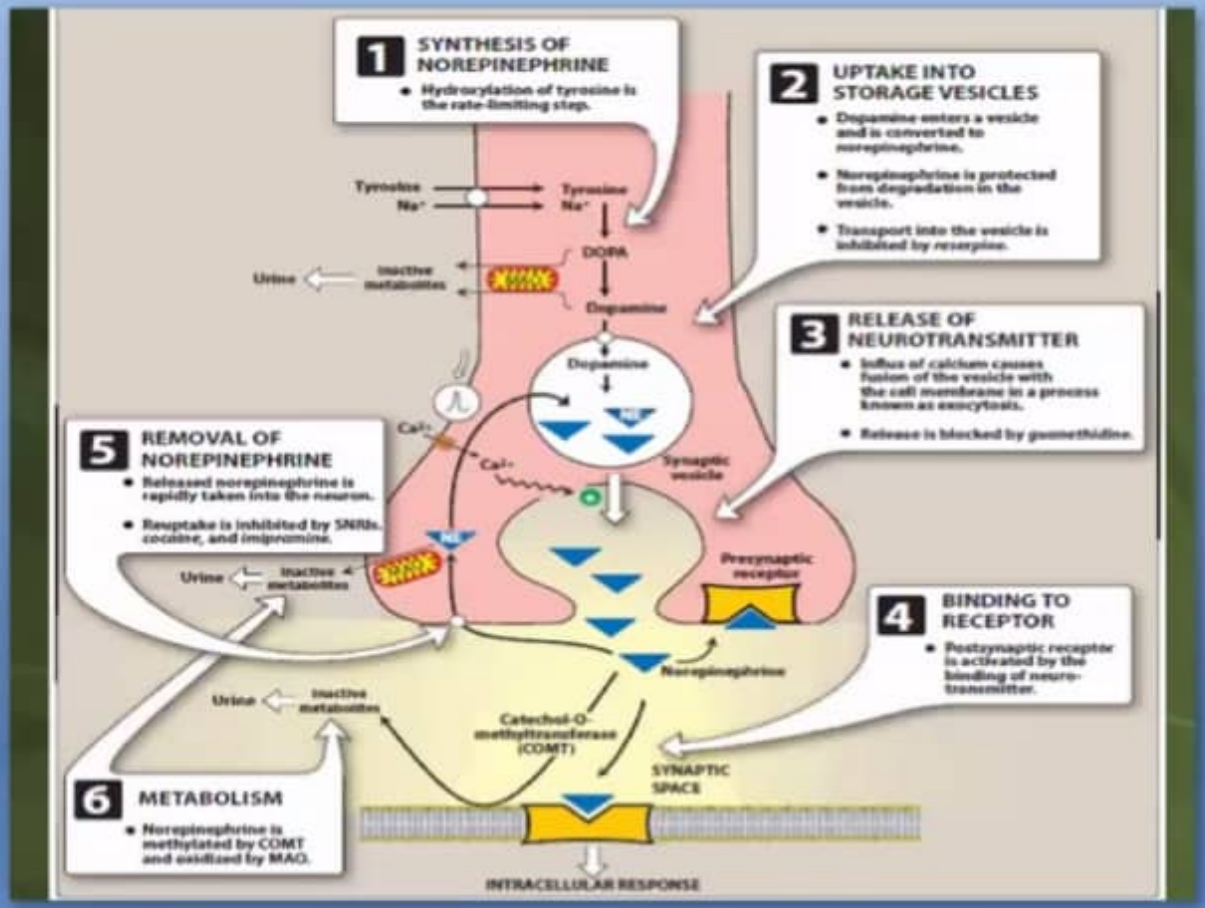
Click to add notes











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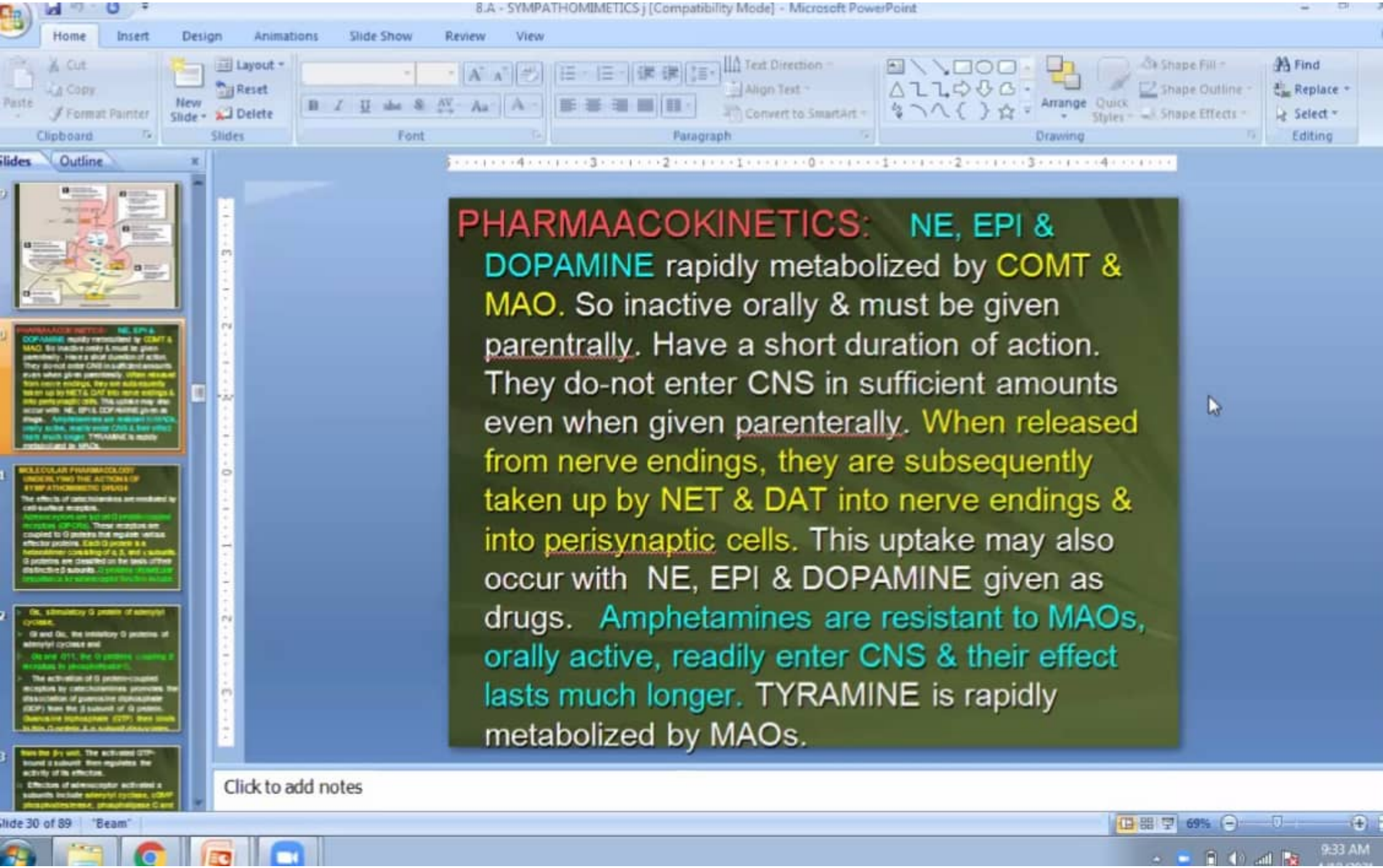

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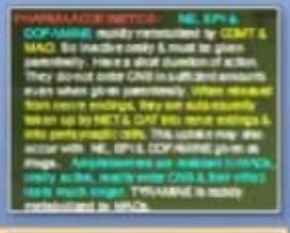

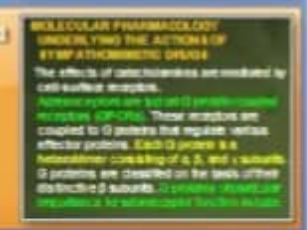

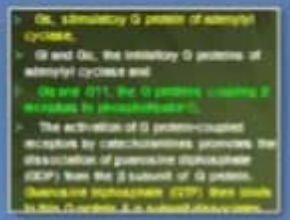

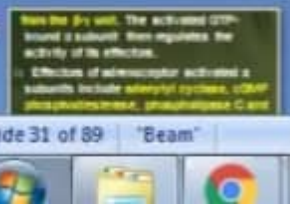

MOLECULAR PHARMACOLOGY UNDERLYING THE ACTIONS OF SYMPATHOMIMETIC DRUGS

The effects of catecholamines are mediated by cell-surface receptors.

Adrenoceptors are typical G protein-coupled receptors (GPCRs). These receptors are coupled to G proteins that regulate various effector proteins. Each G protein is a heterotrimer consisting of α, β, and γ subunits. G proteins are classified on the basis of their distinctive β subunits. G proteins of particular importance for adrenoceptor function include

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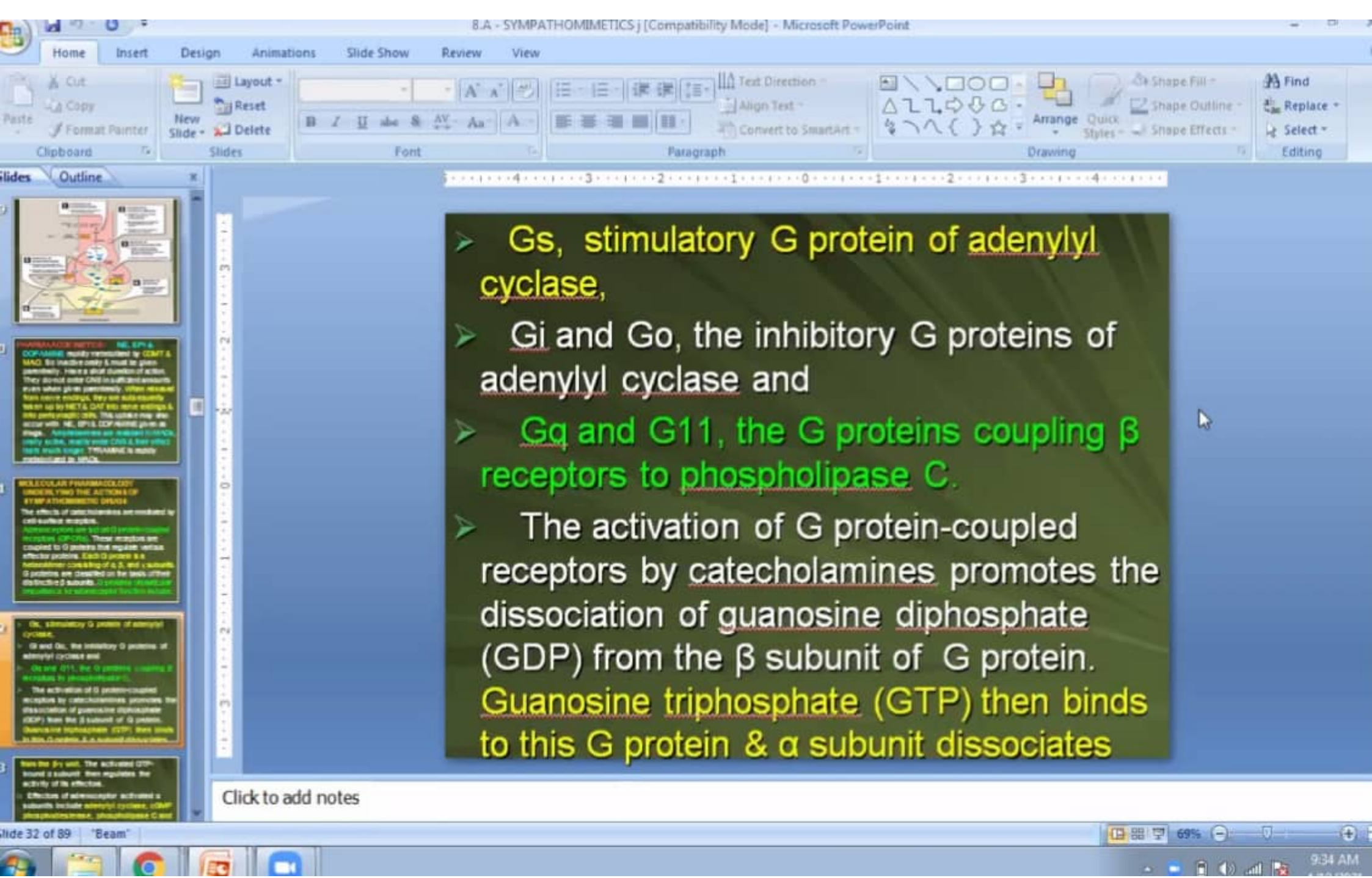

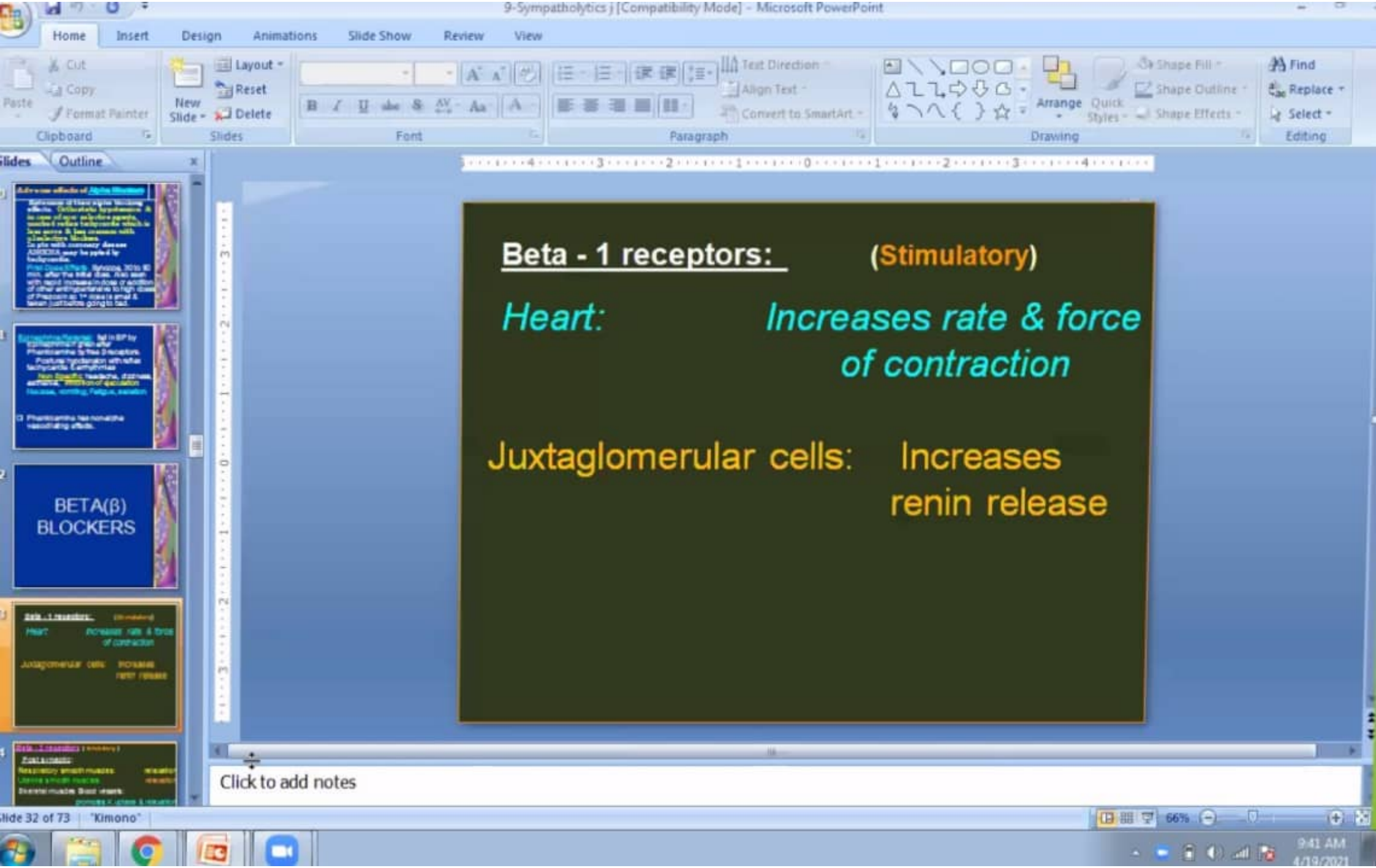

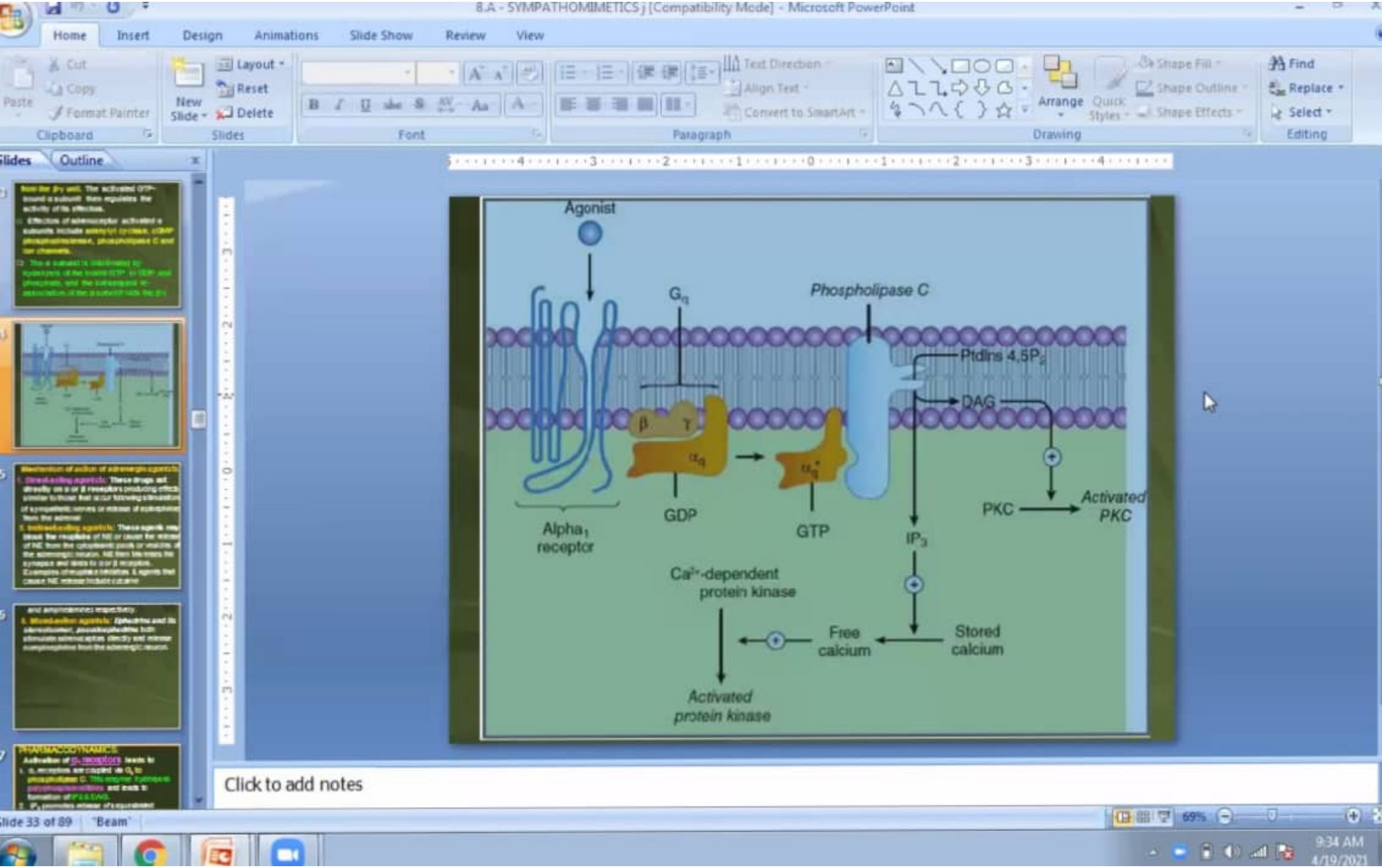

and amphetamines respectively.

3. **Mixed-action agonists: *Ephedrine and its stereoisomer, pseudoephedrine*** both stimulate adrenoceptors directly and release norepinephrine from the adrenergic neuron.

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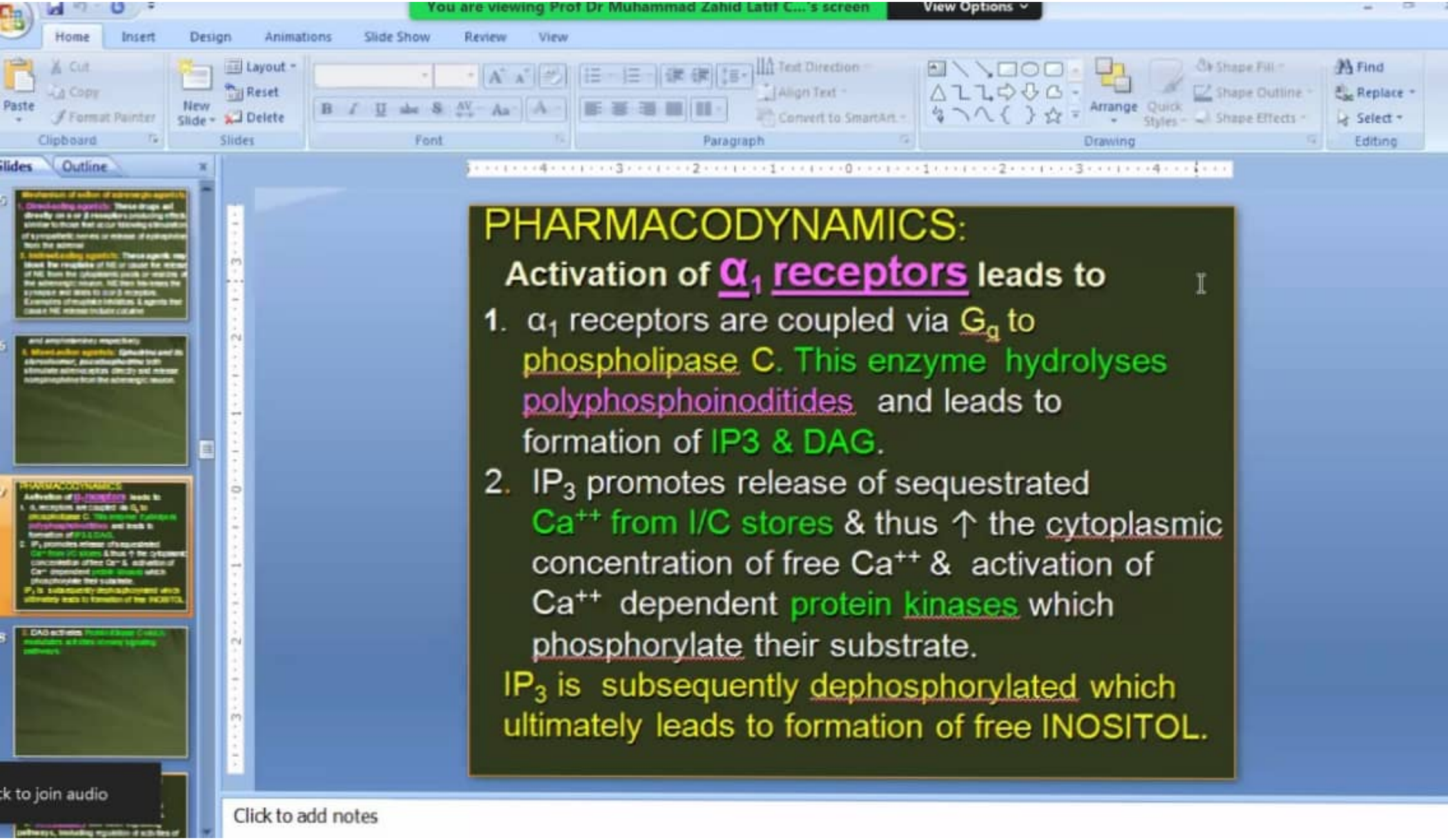

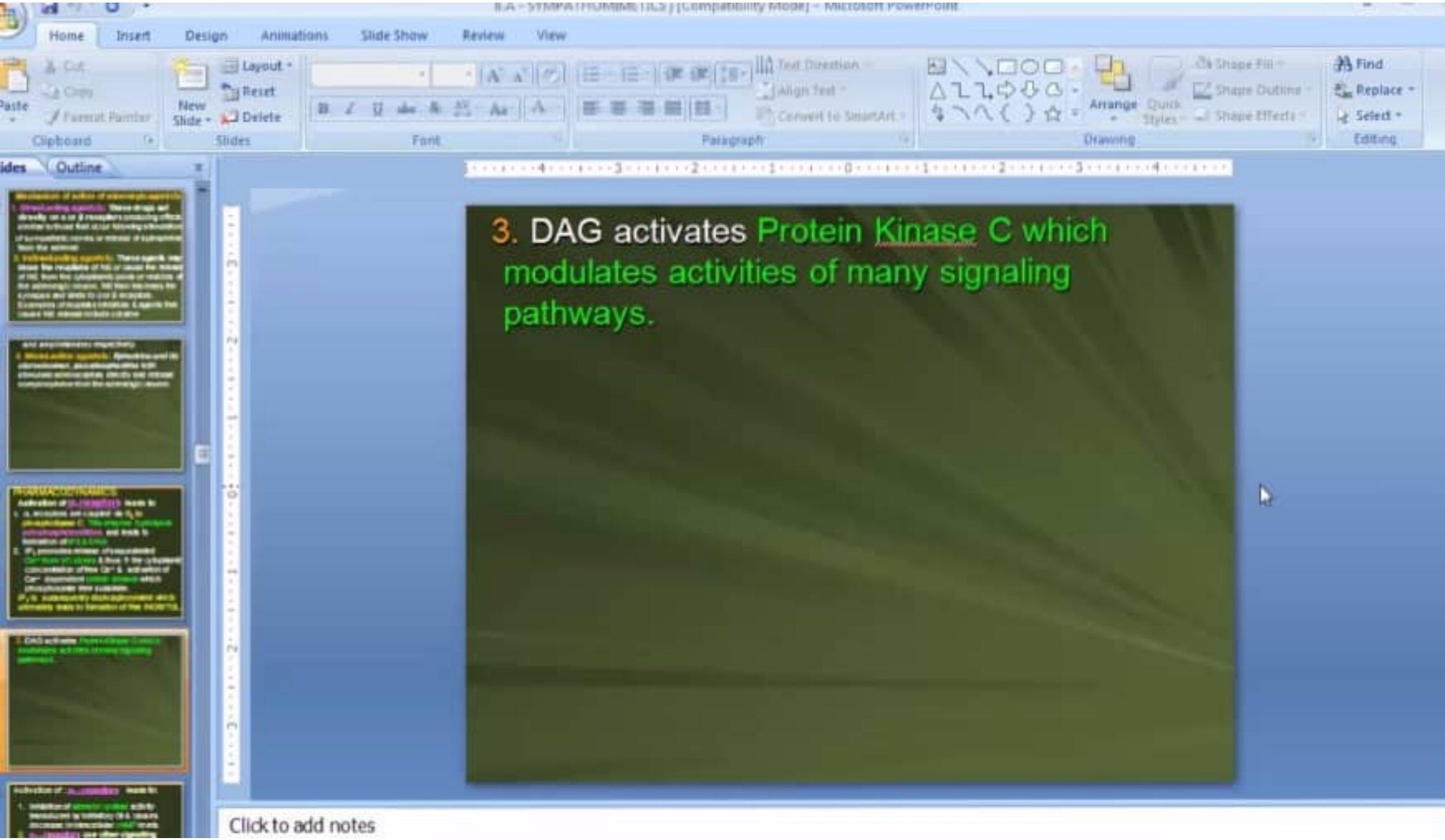

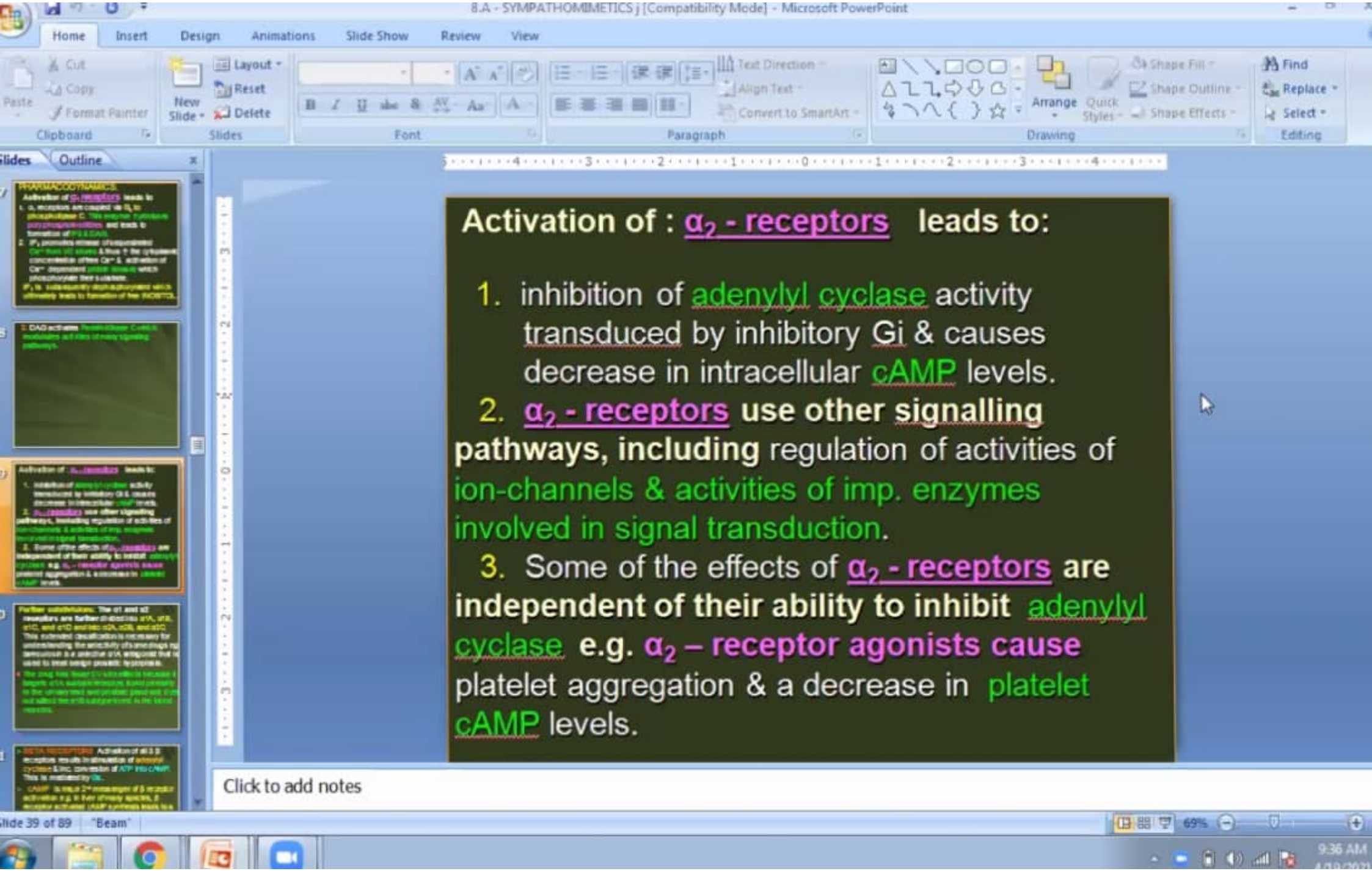

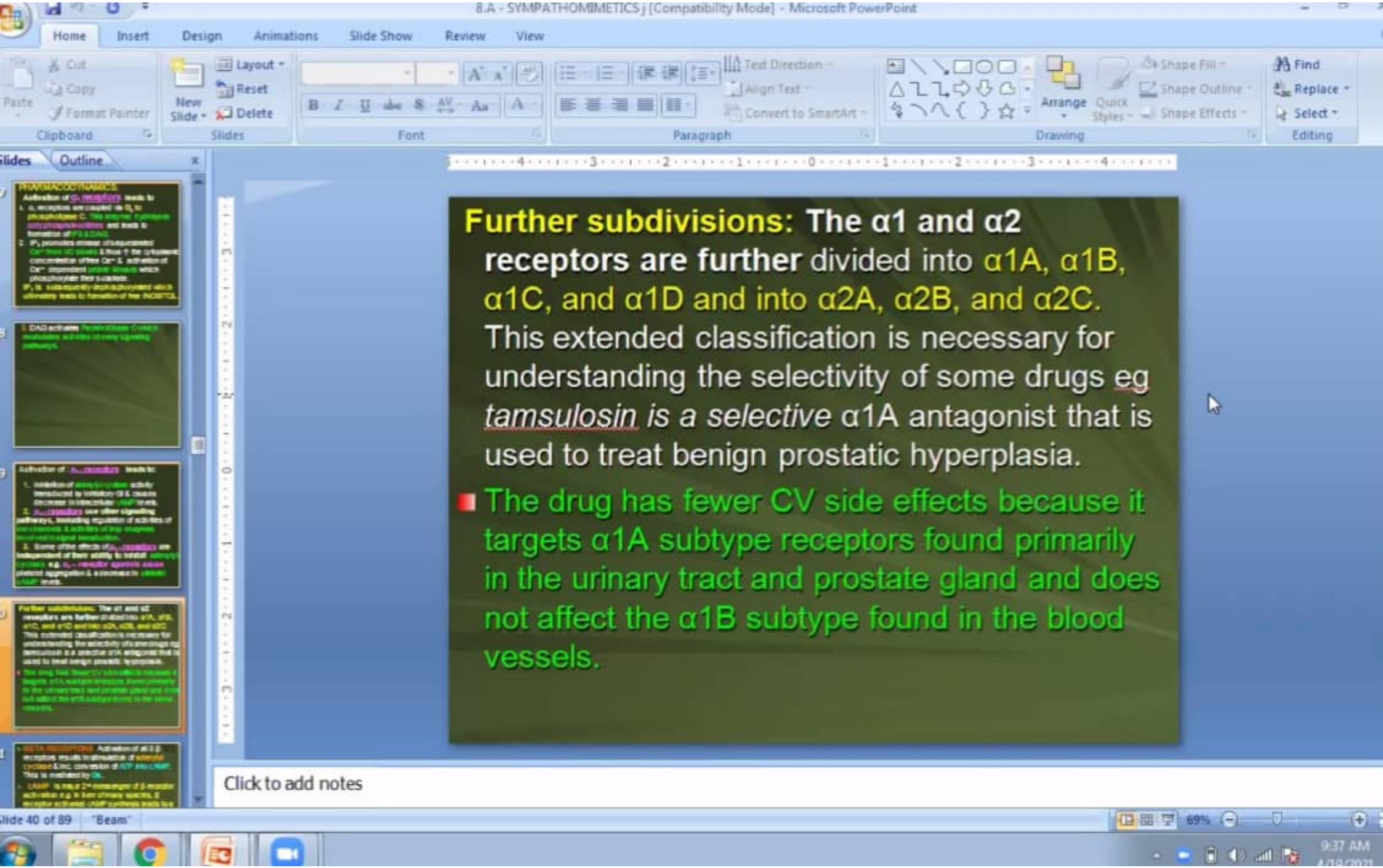

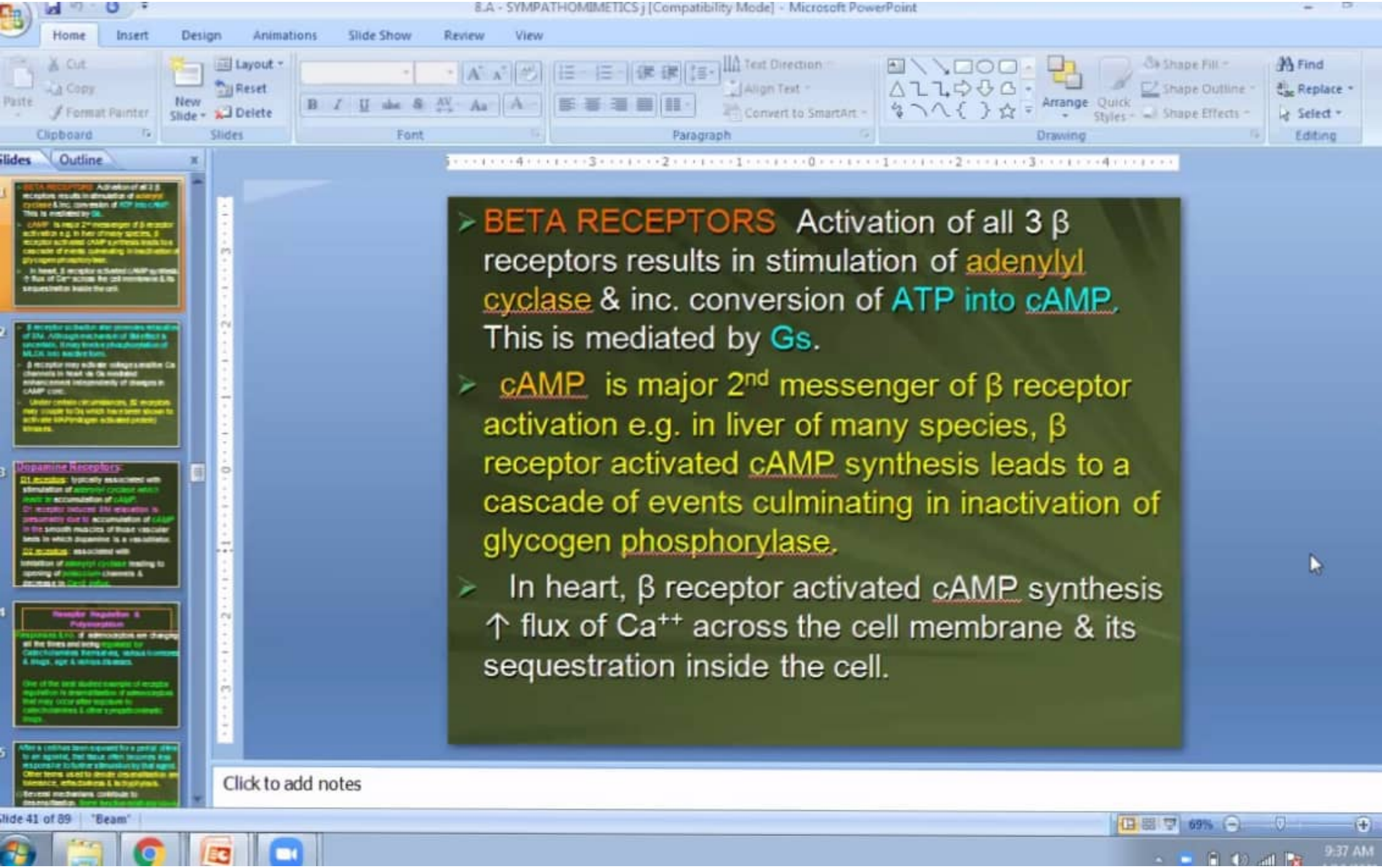

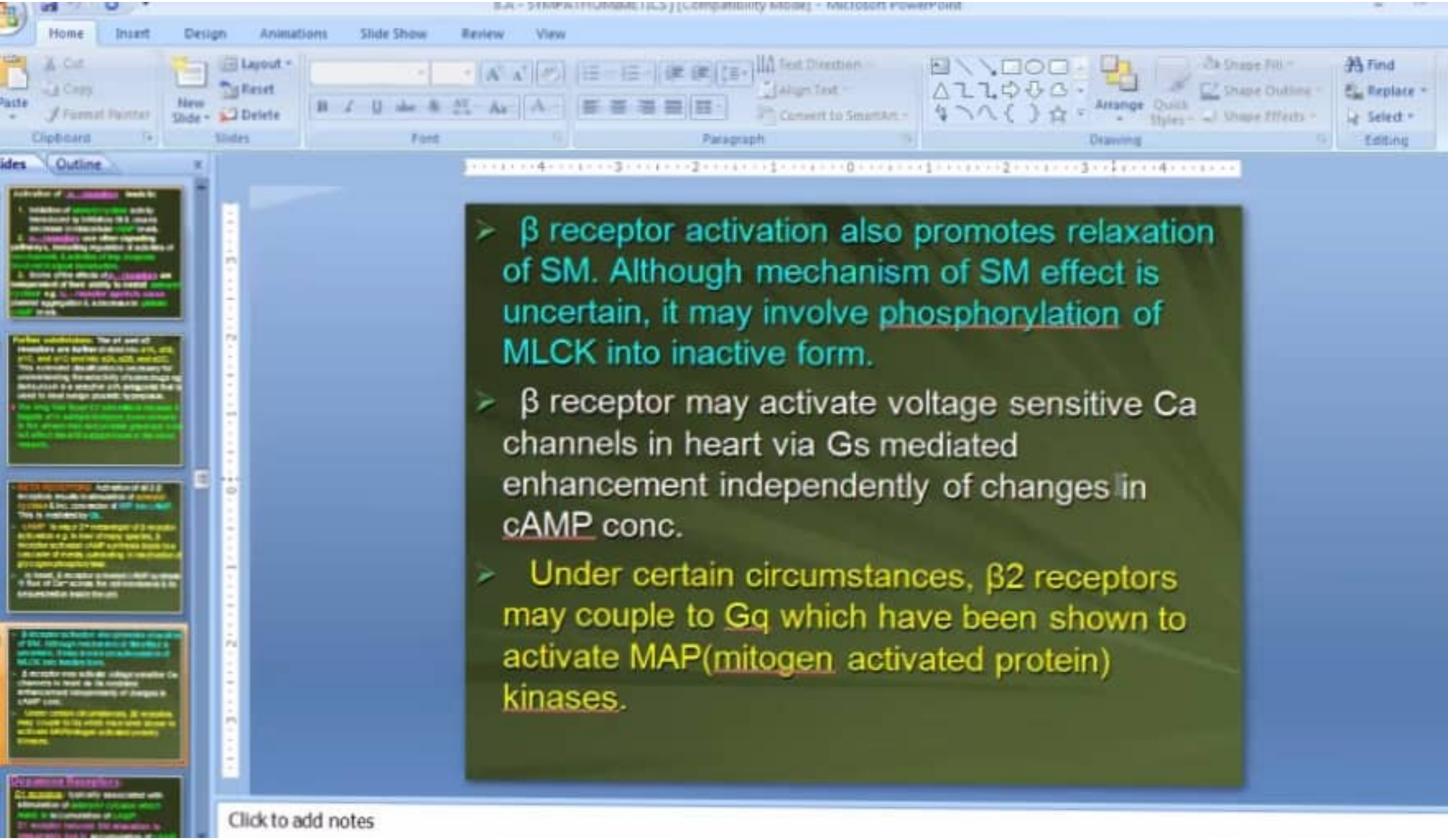

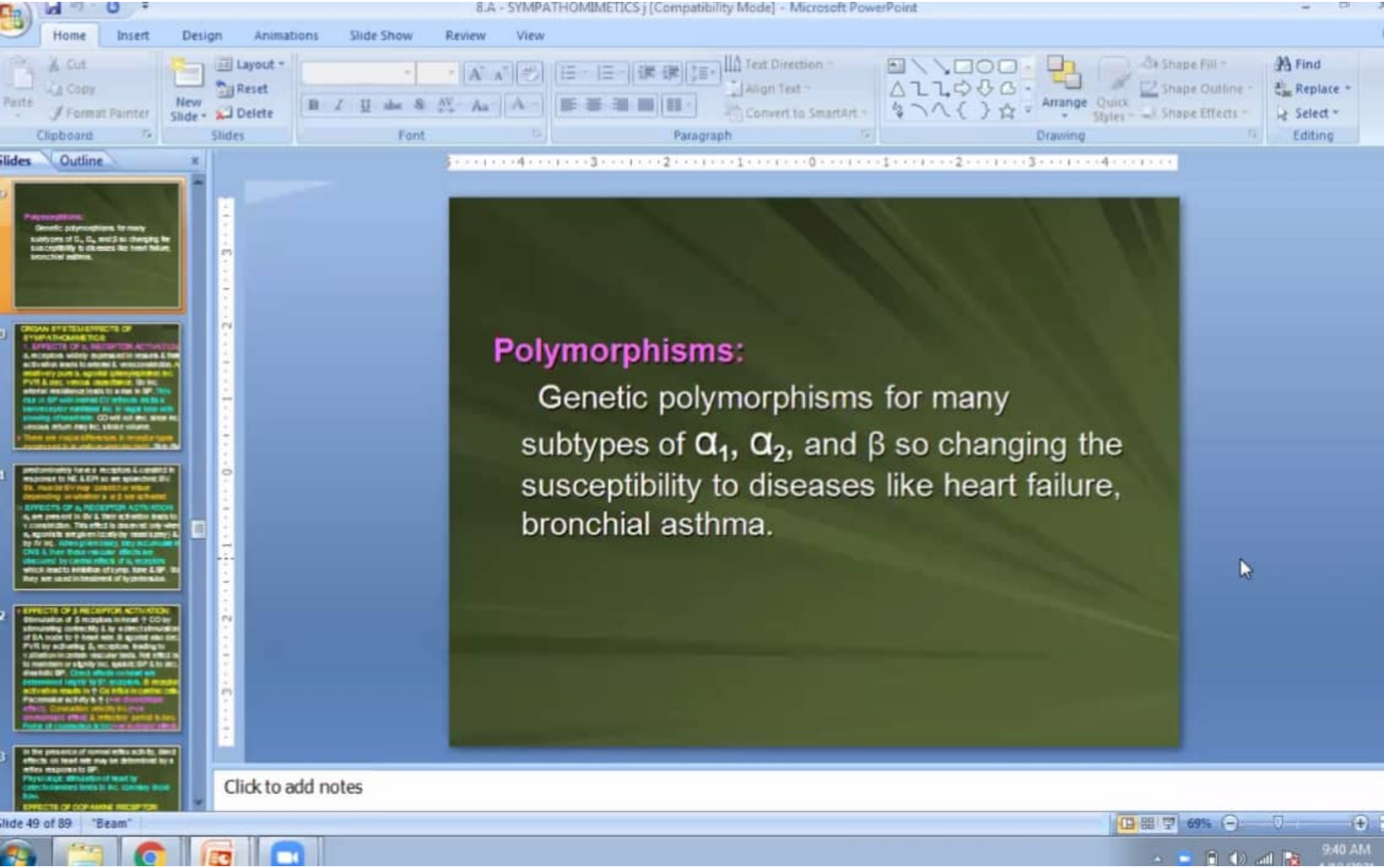

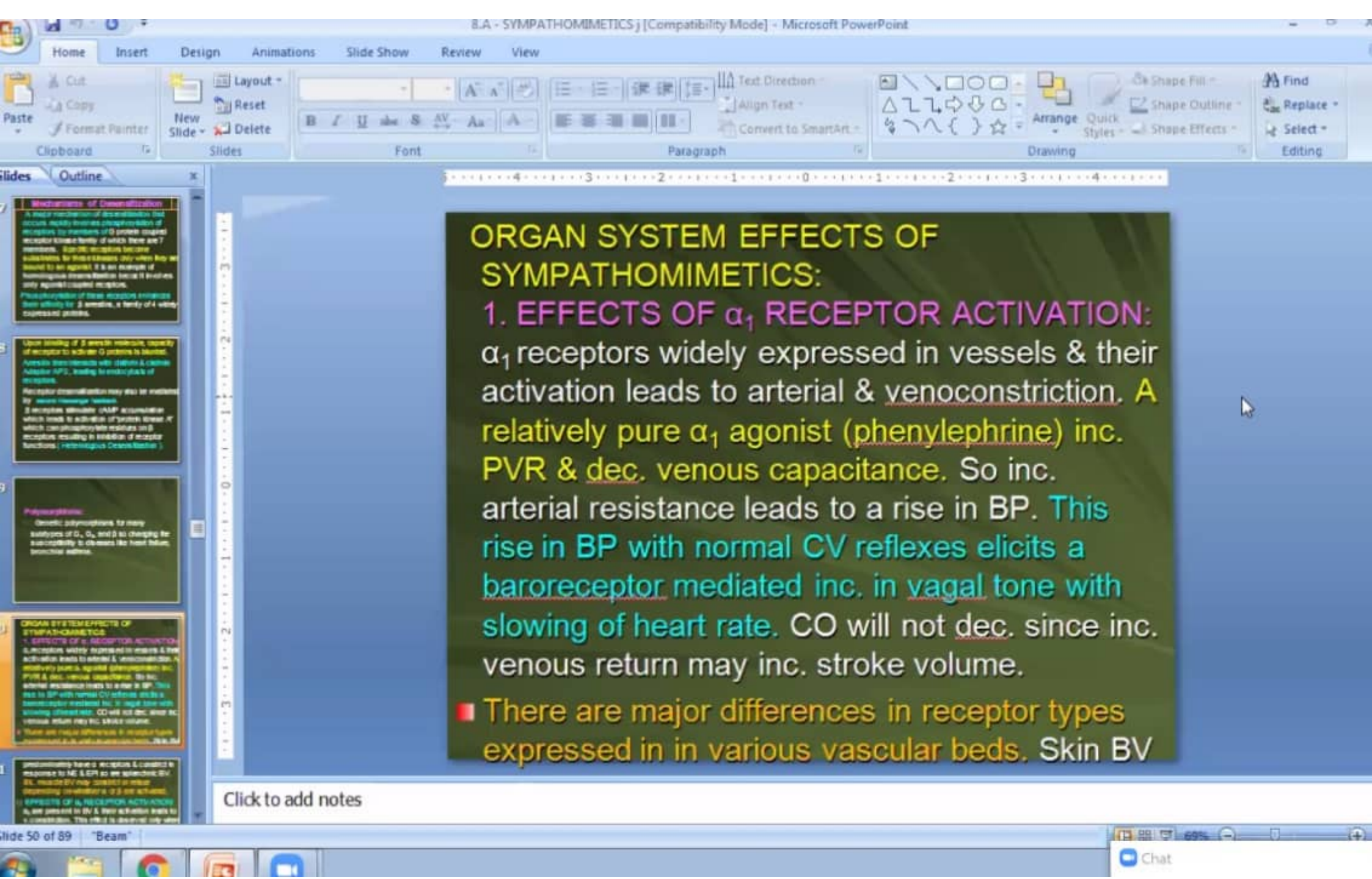

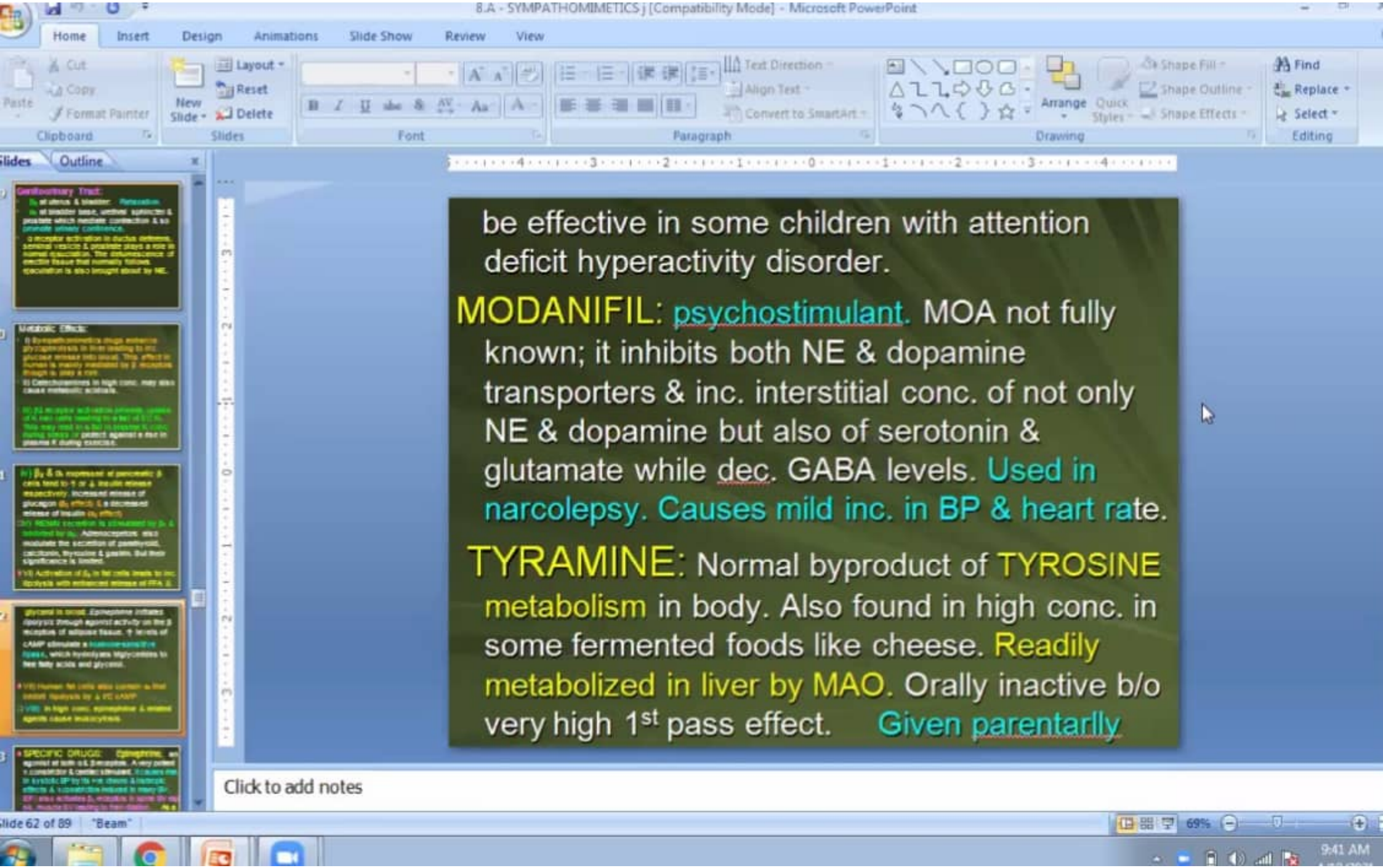

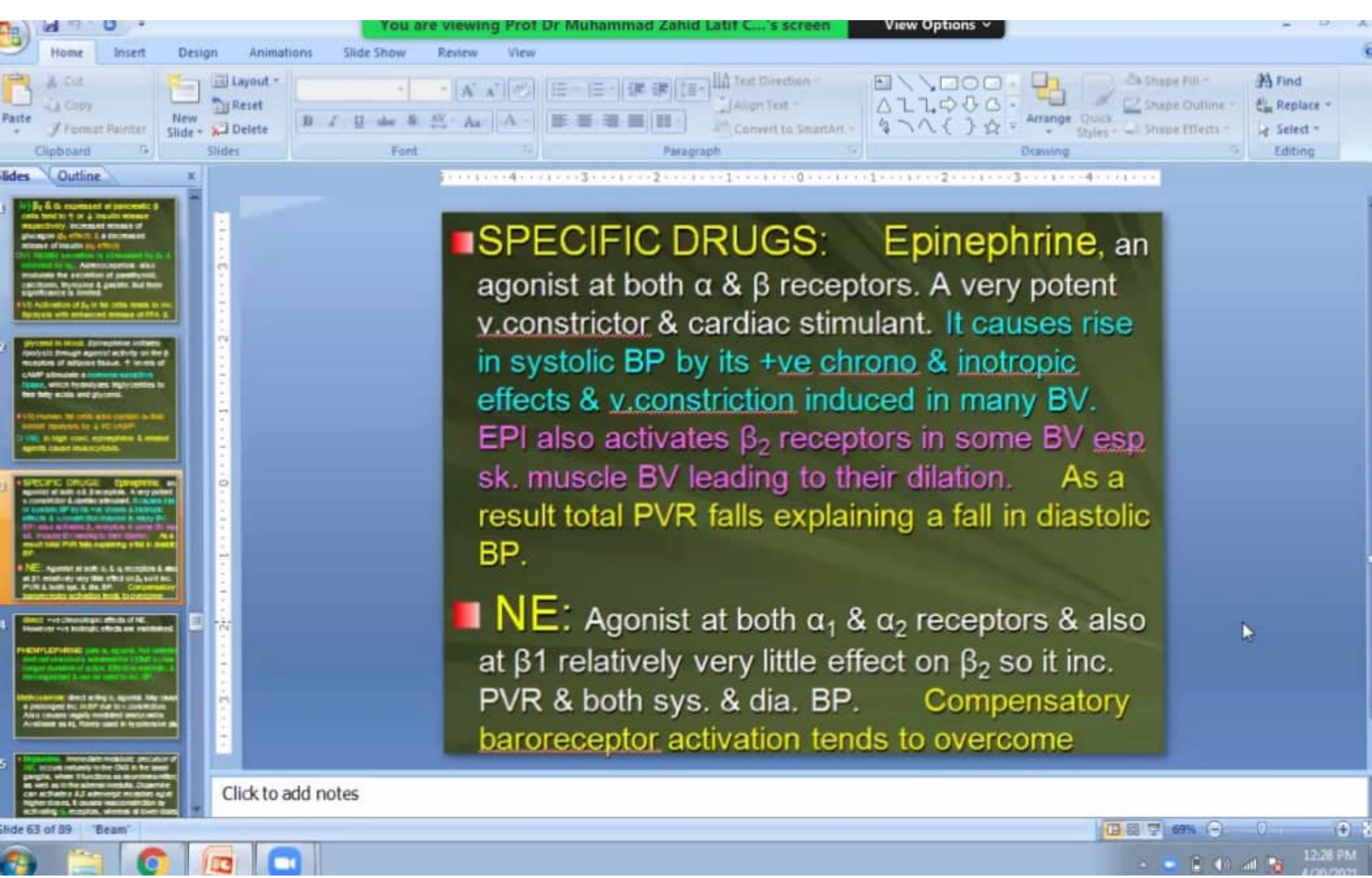

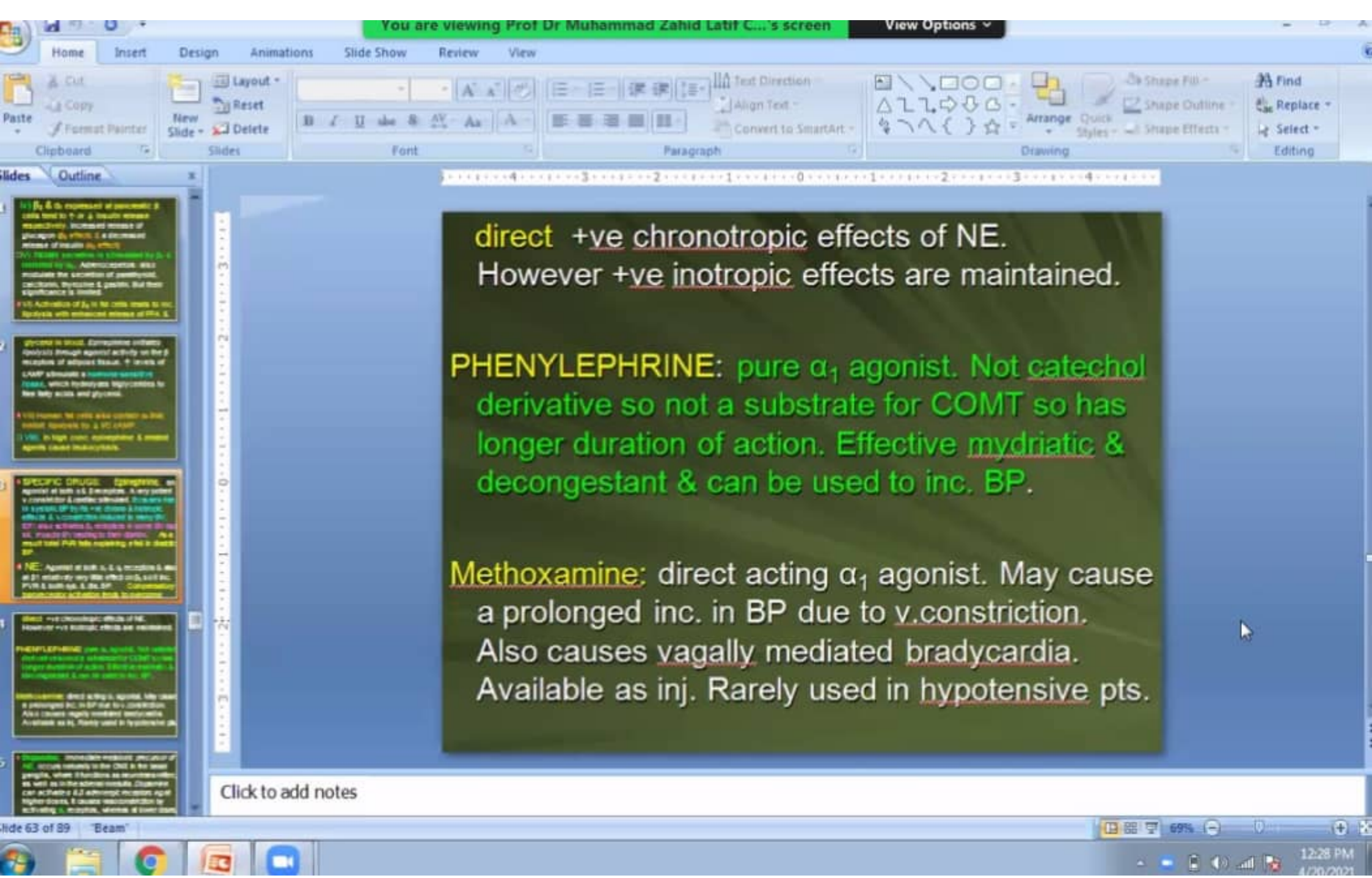

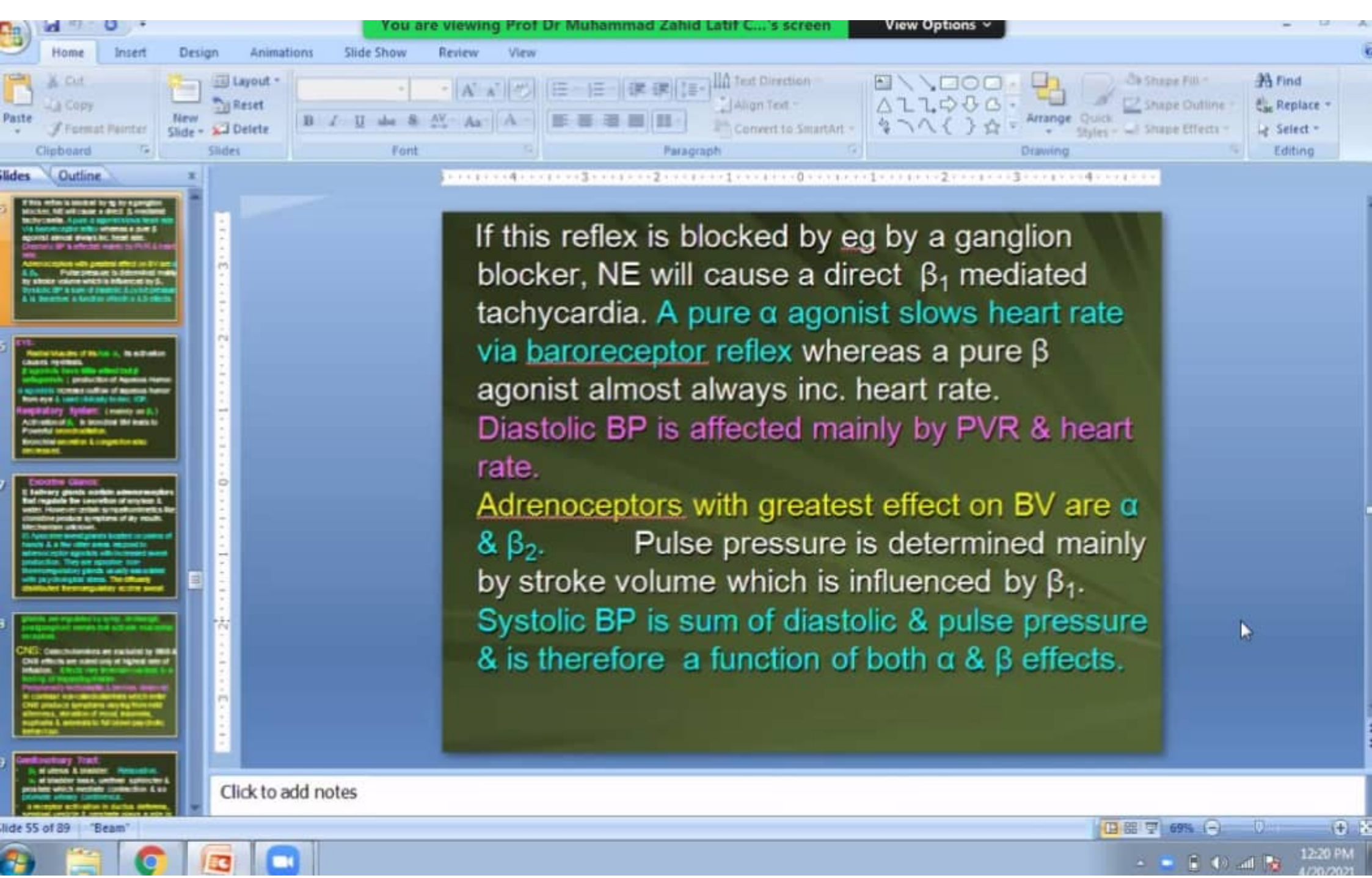

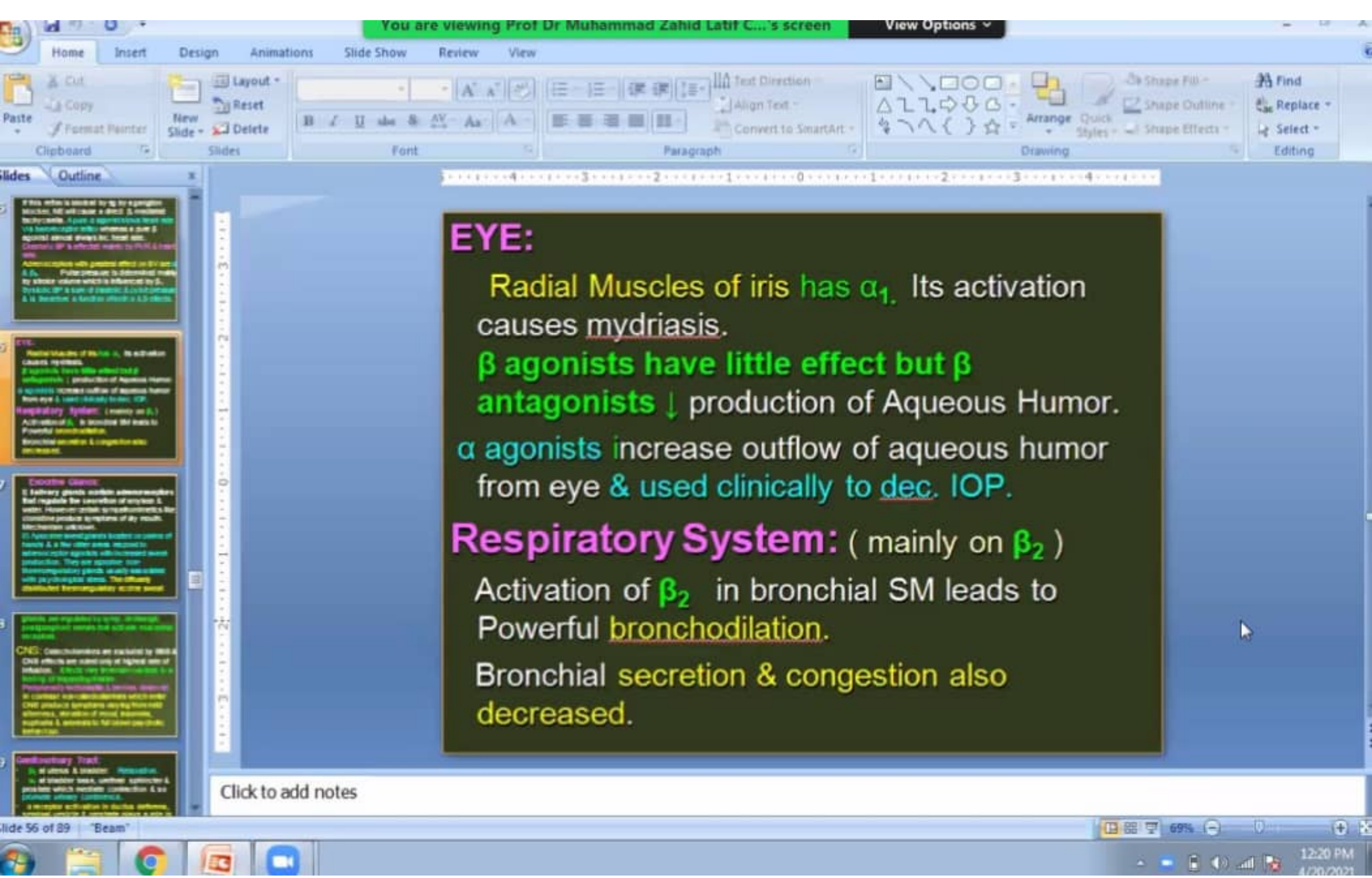

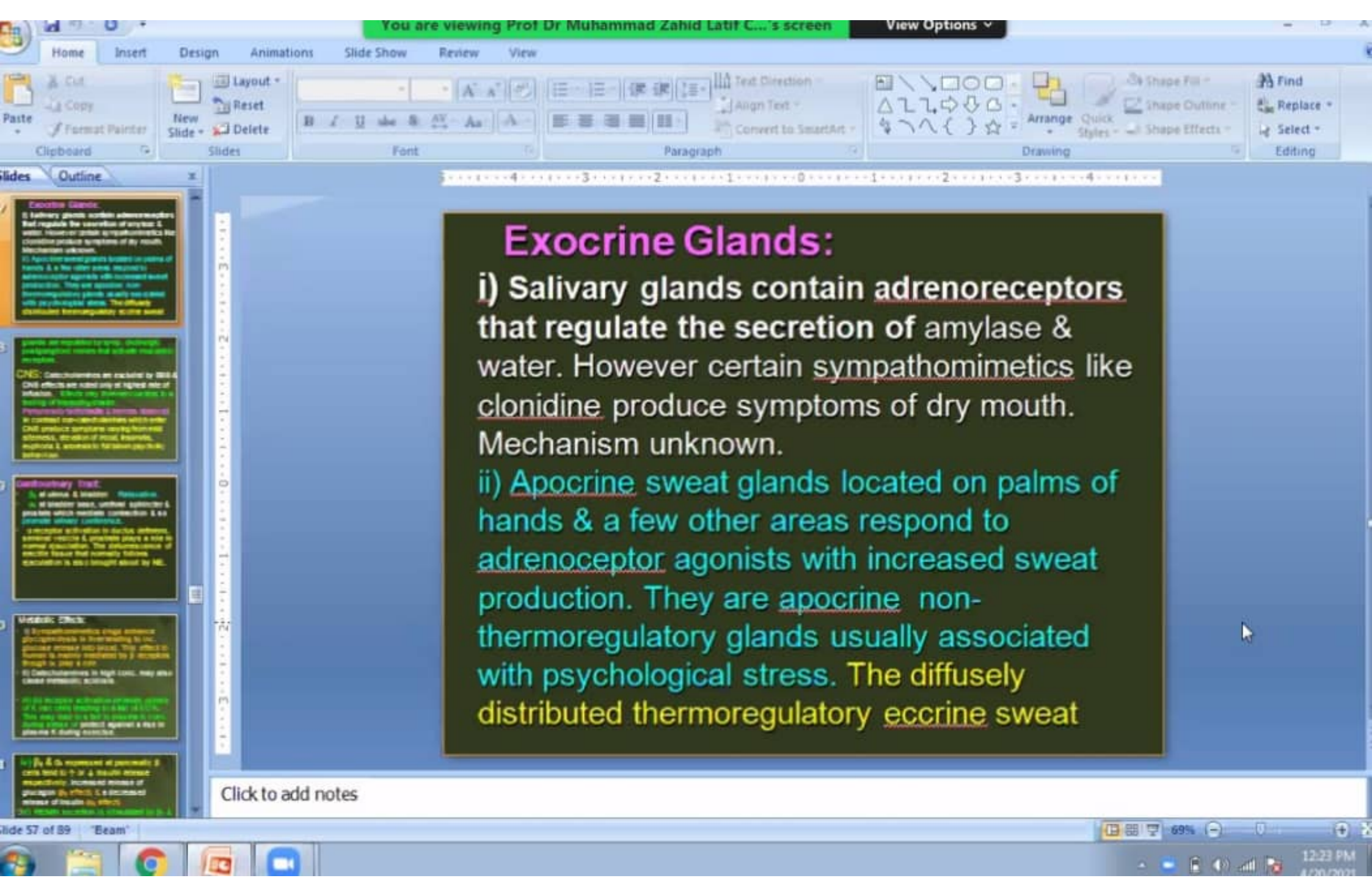

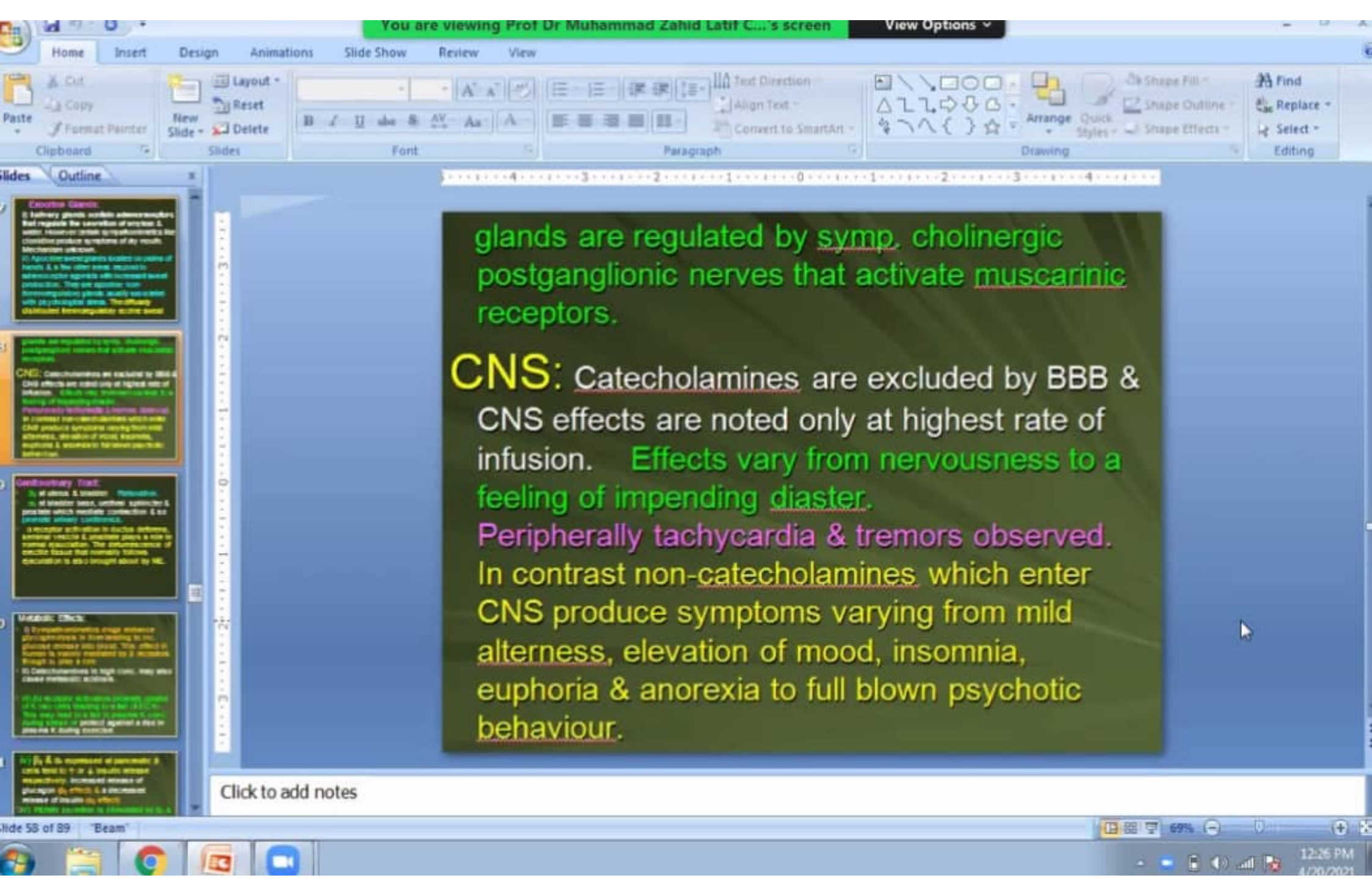

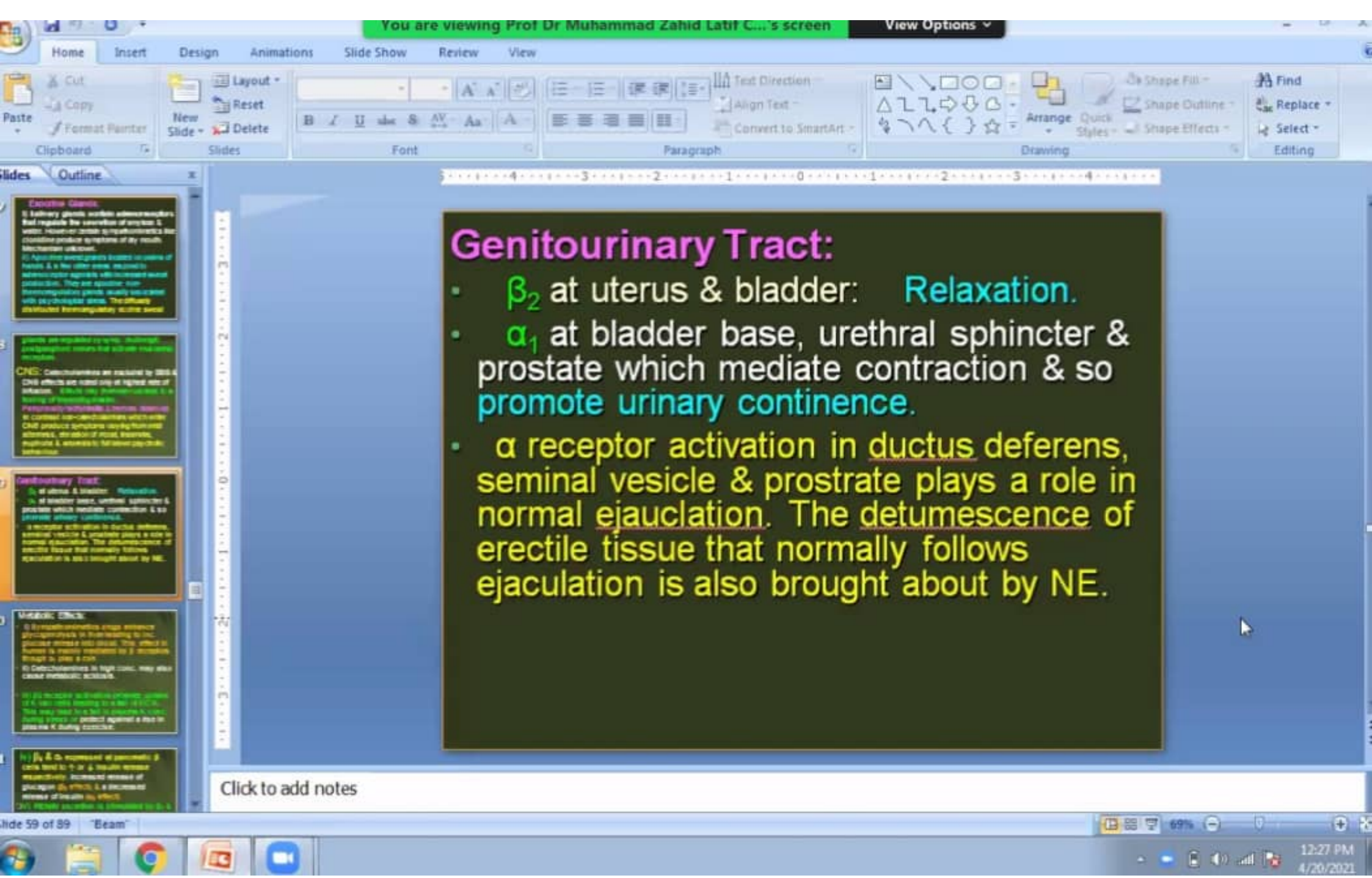

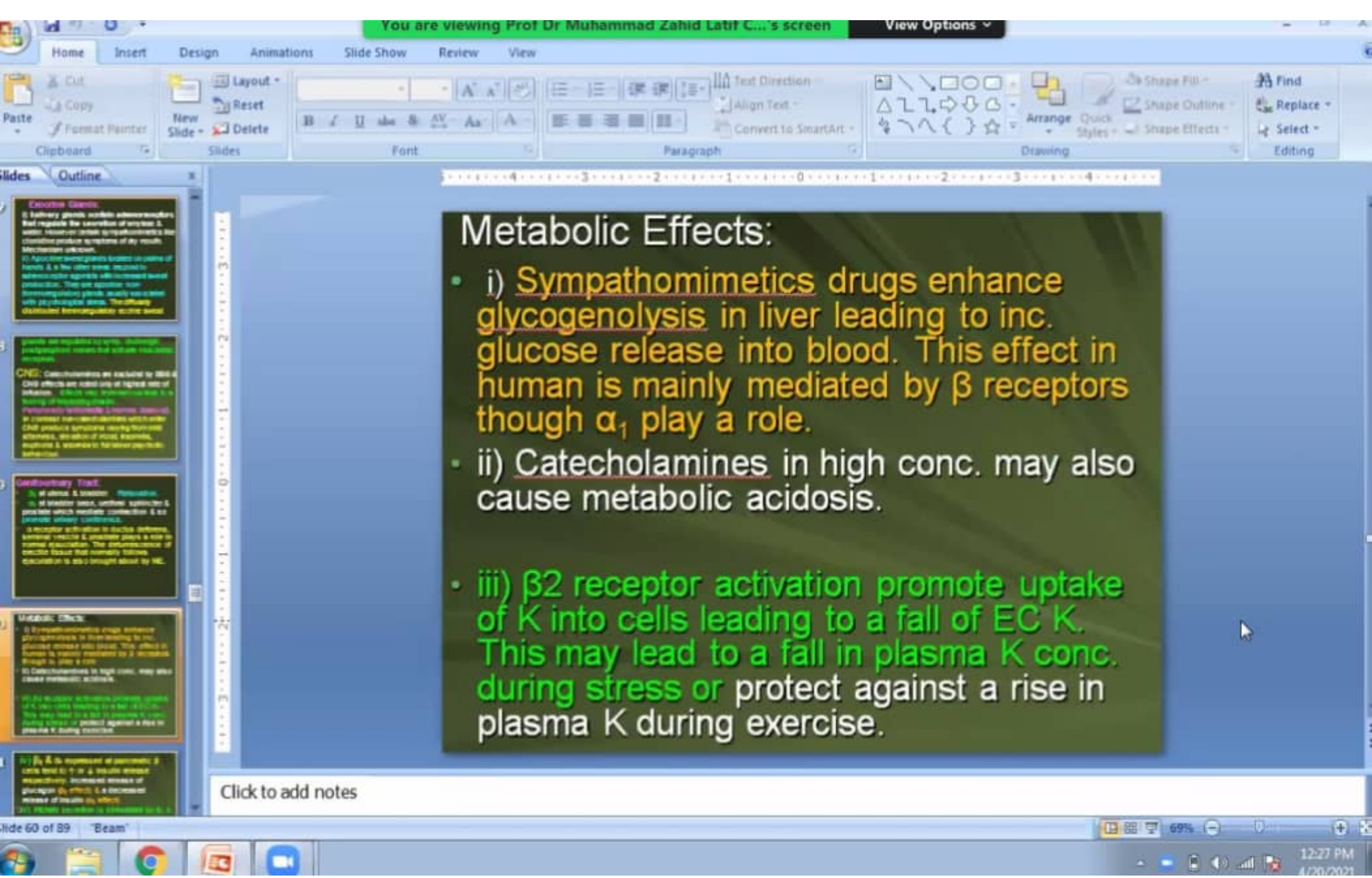

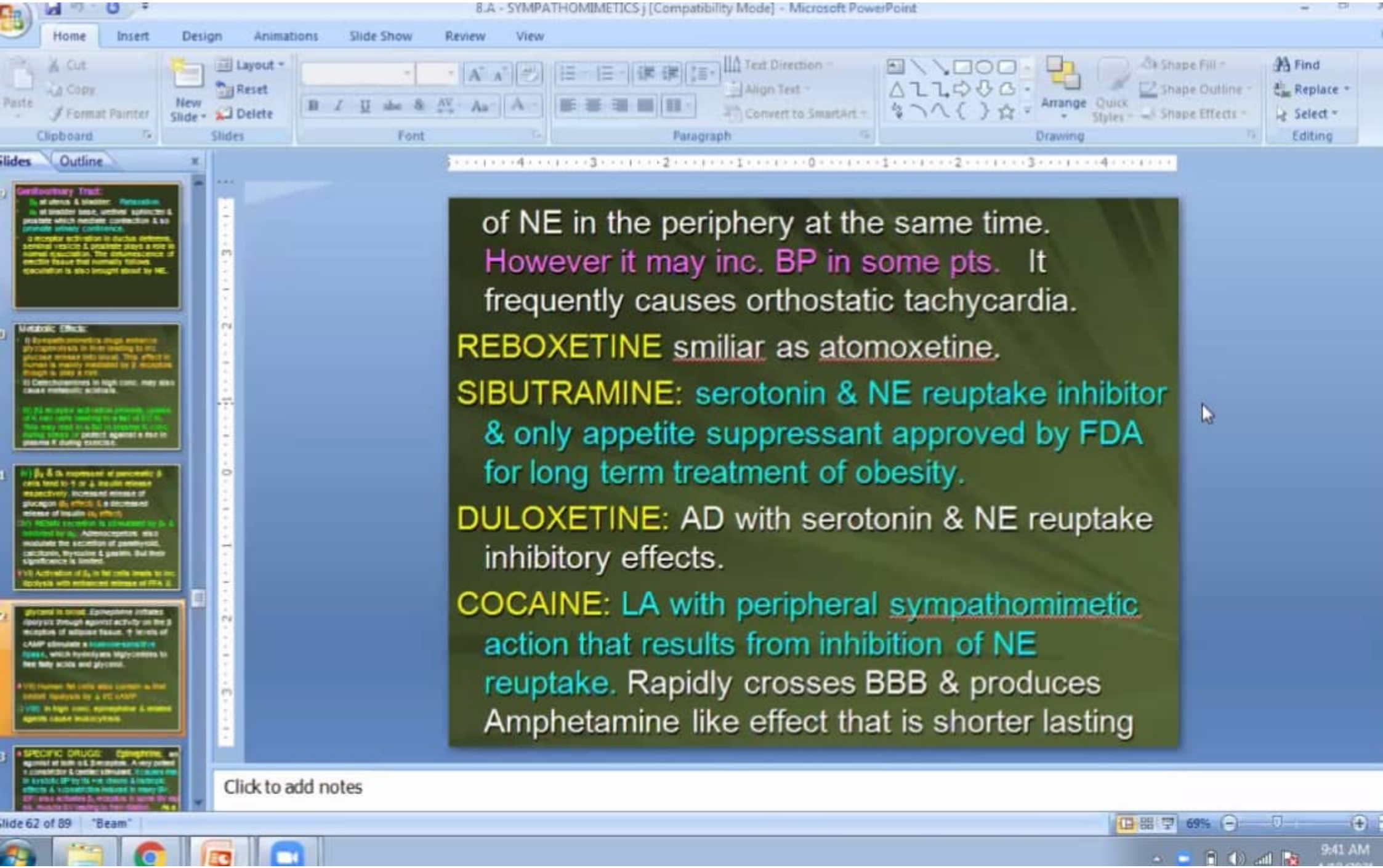

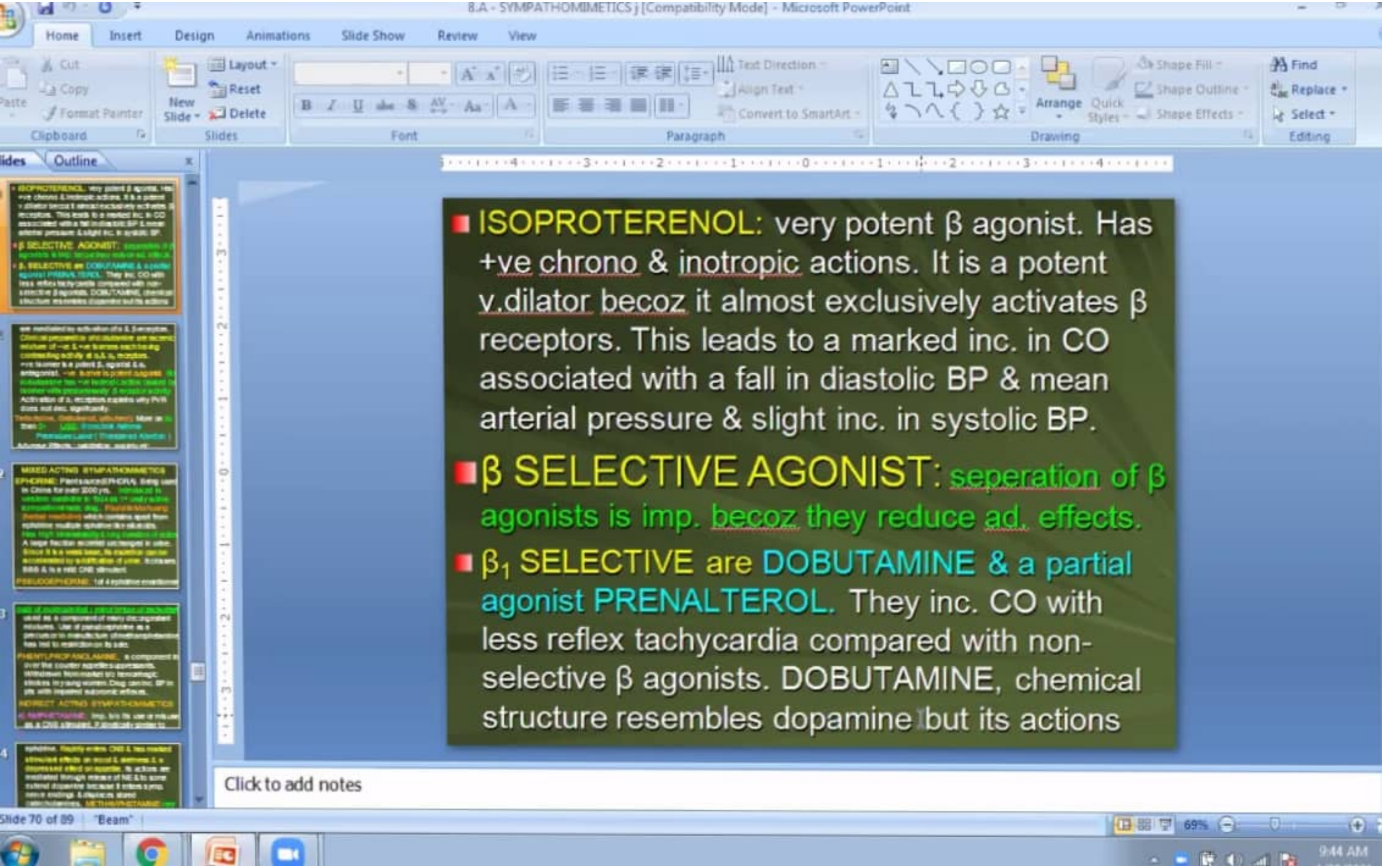

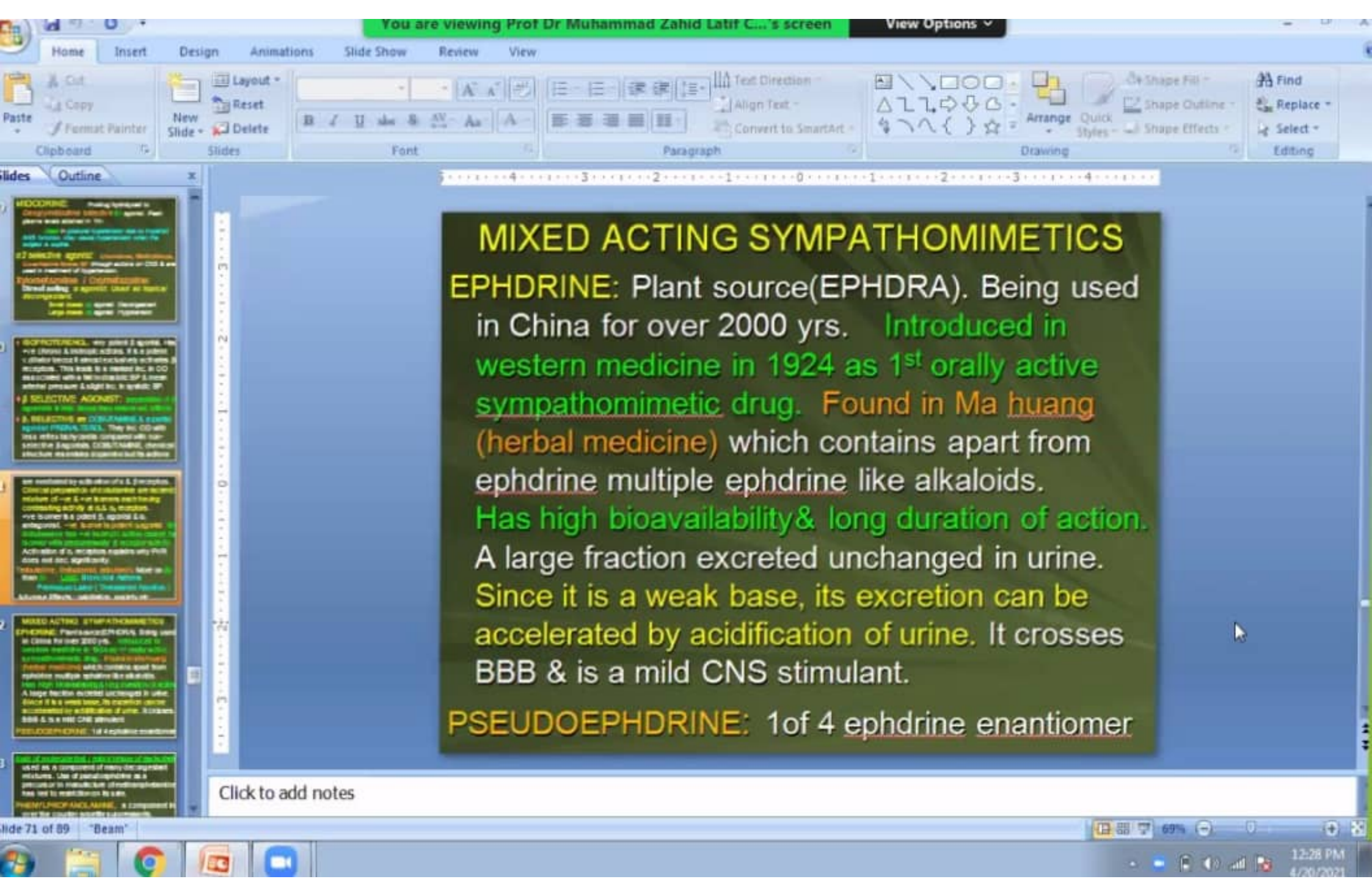

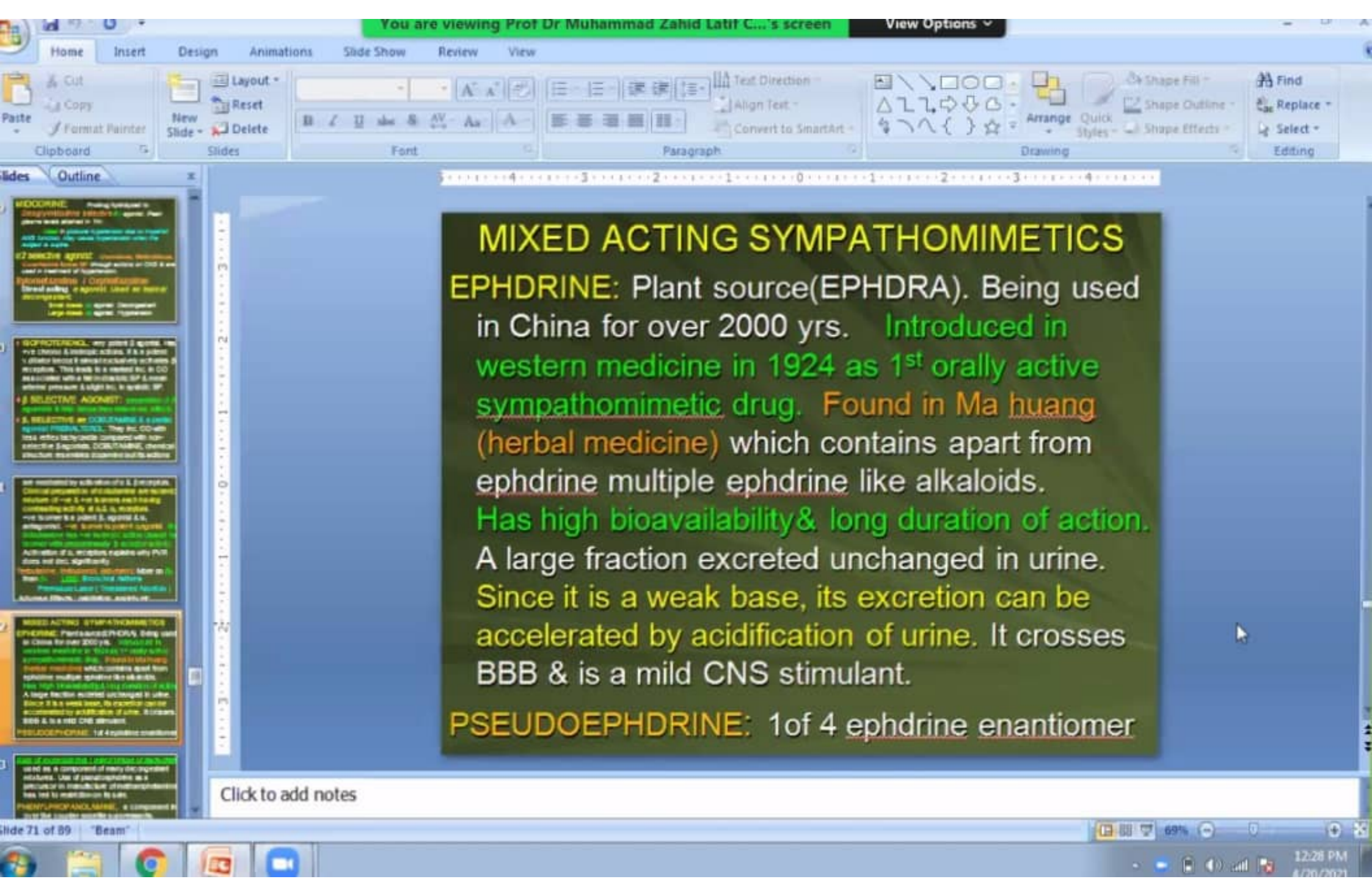

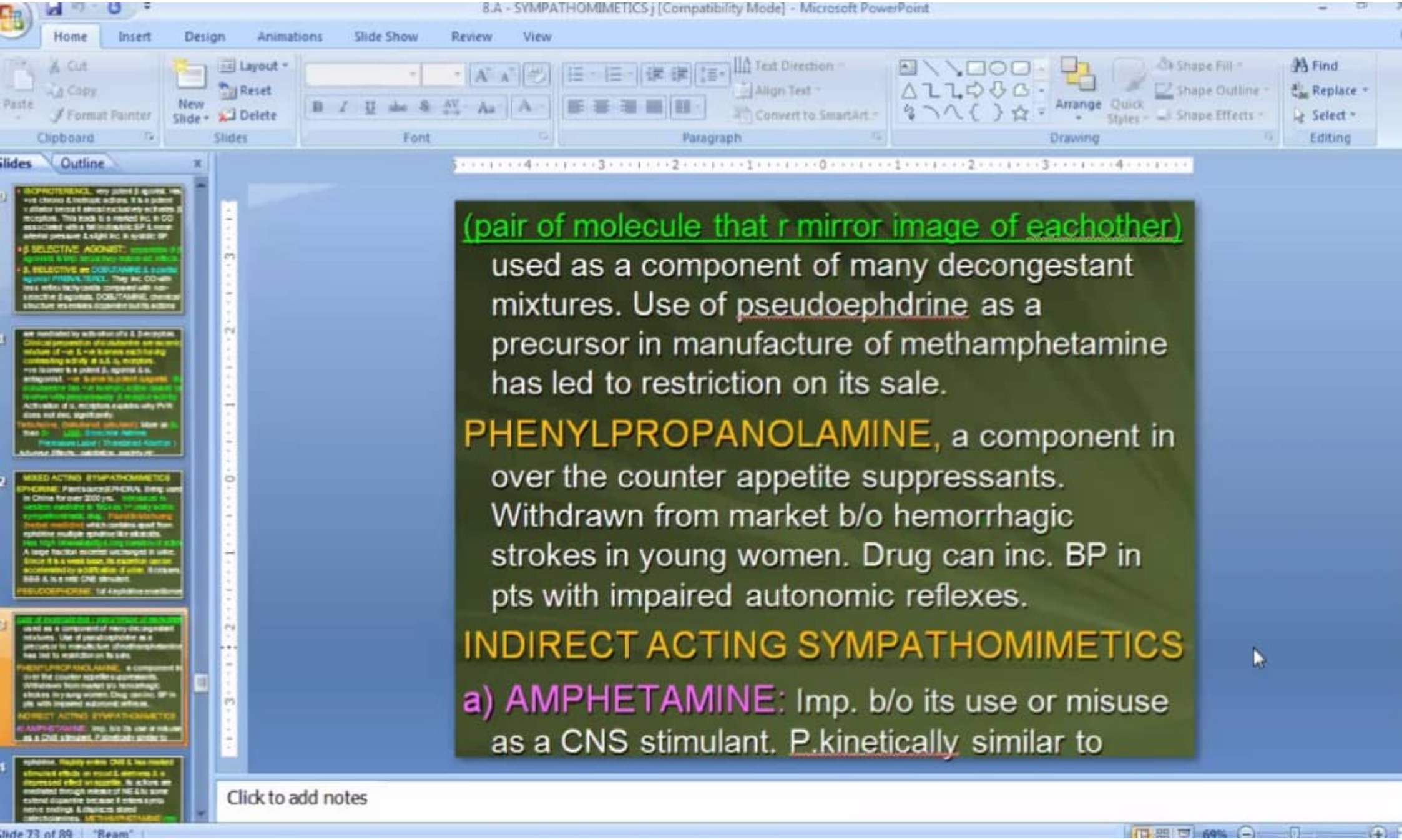

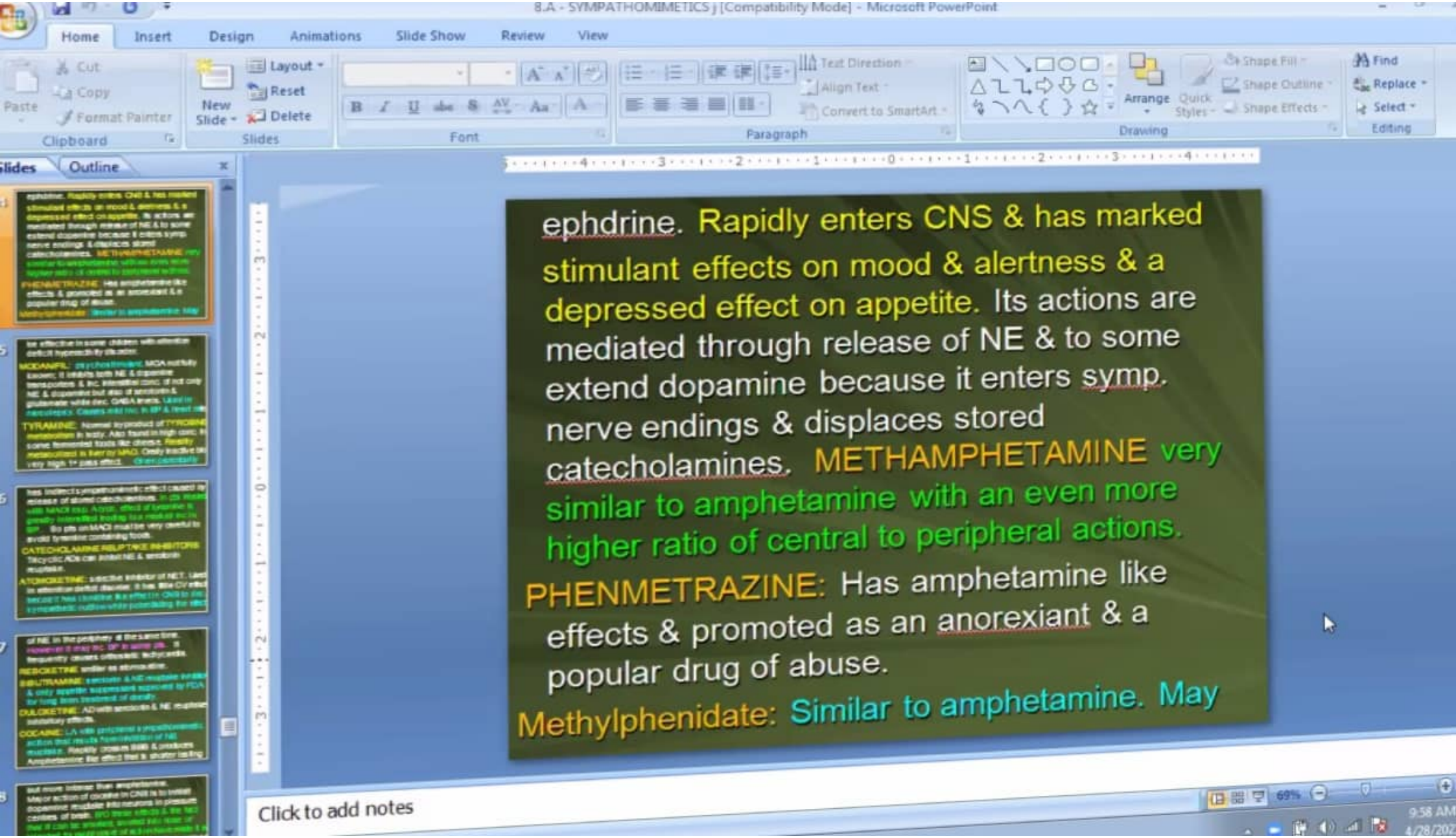

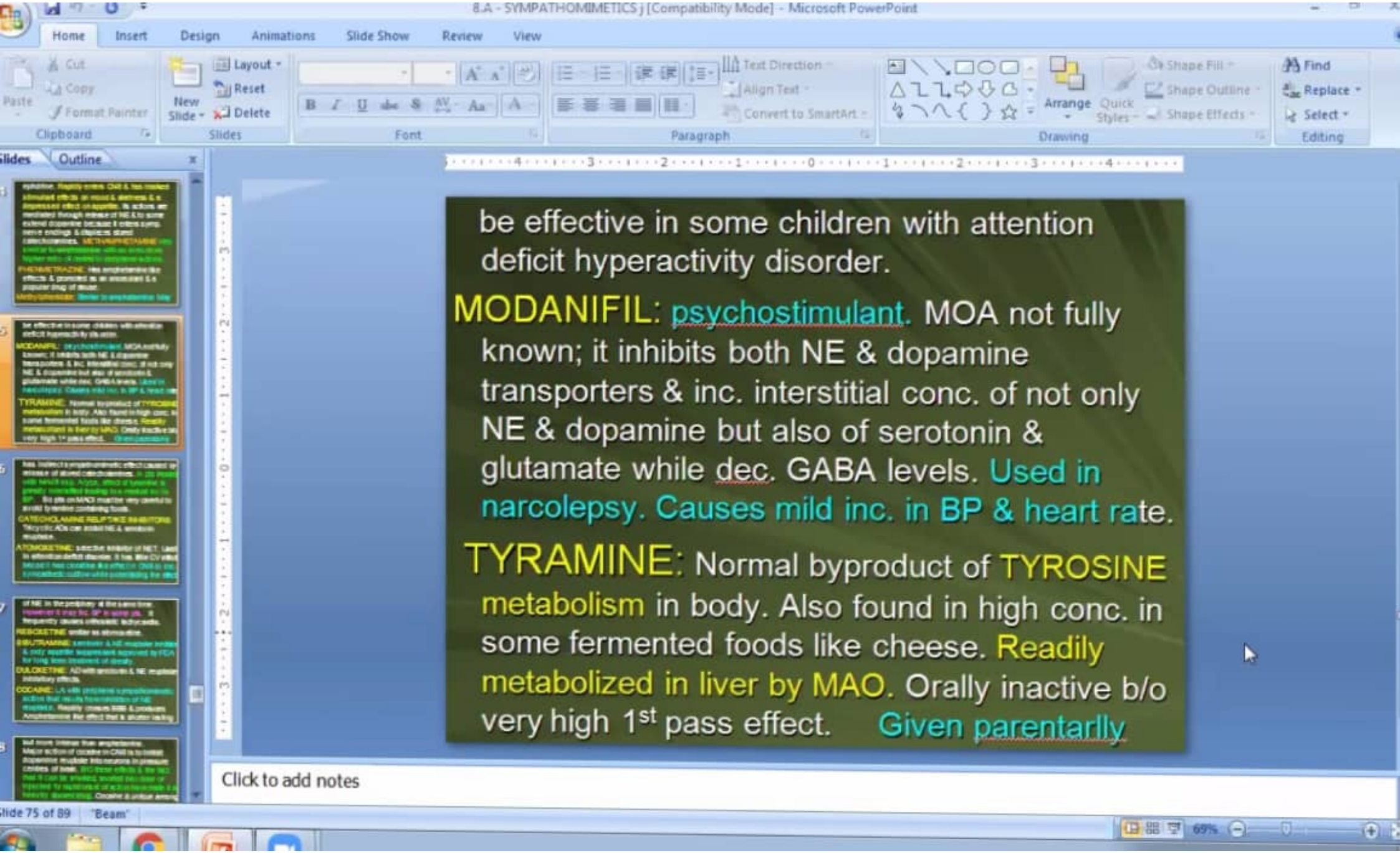

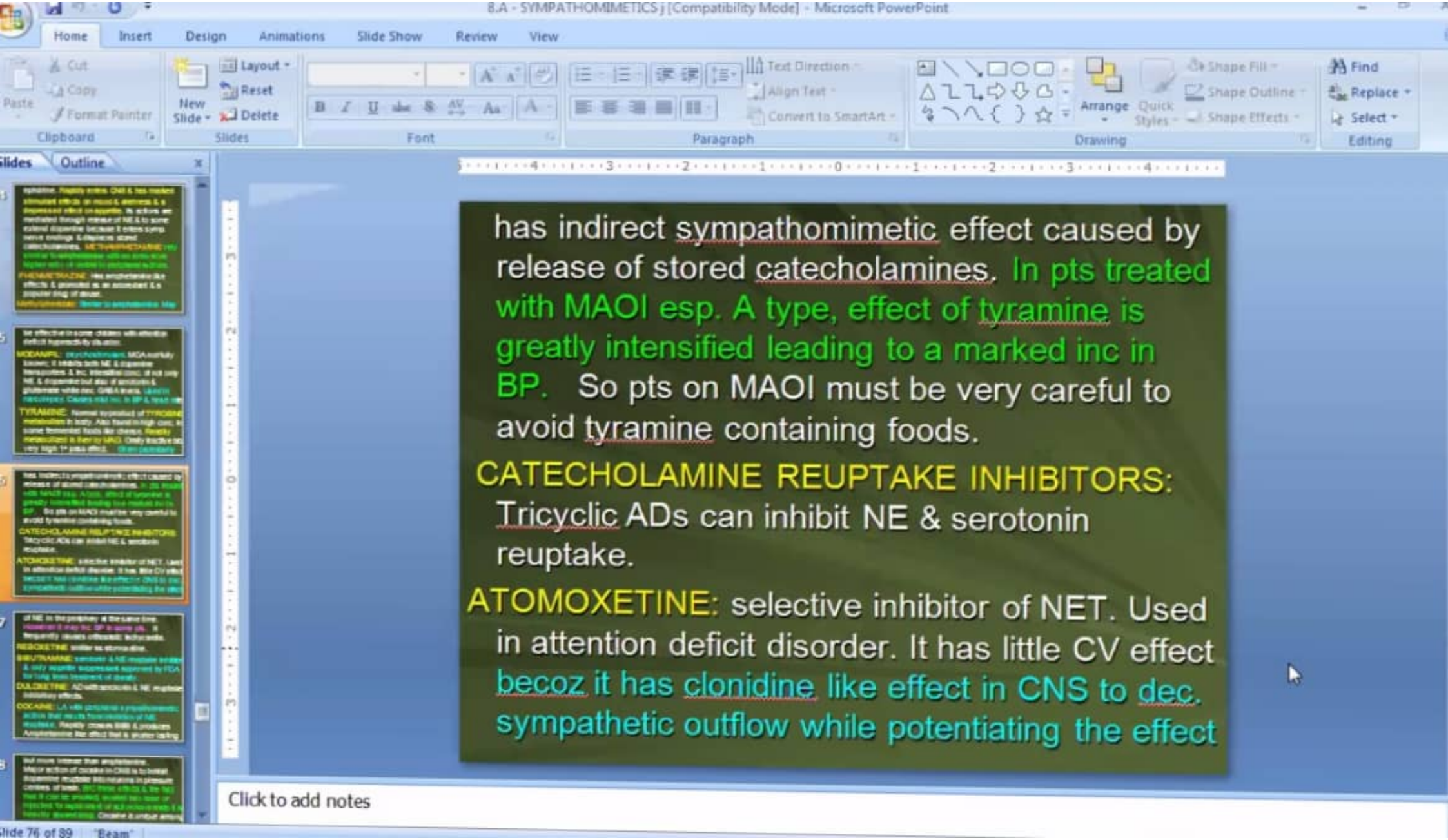

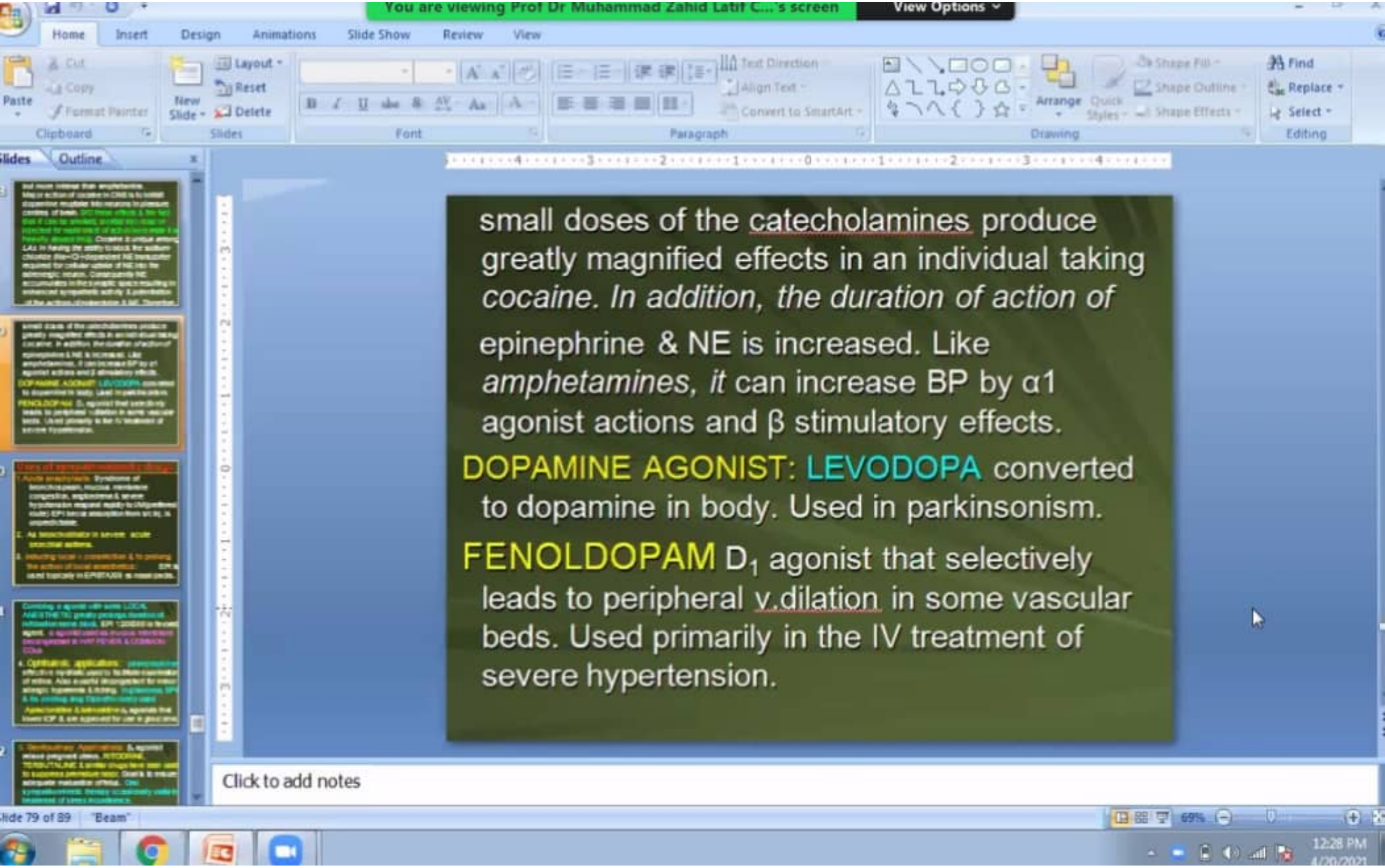

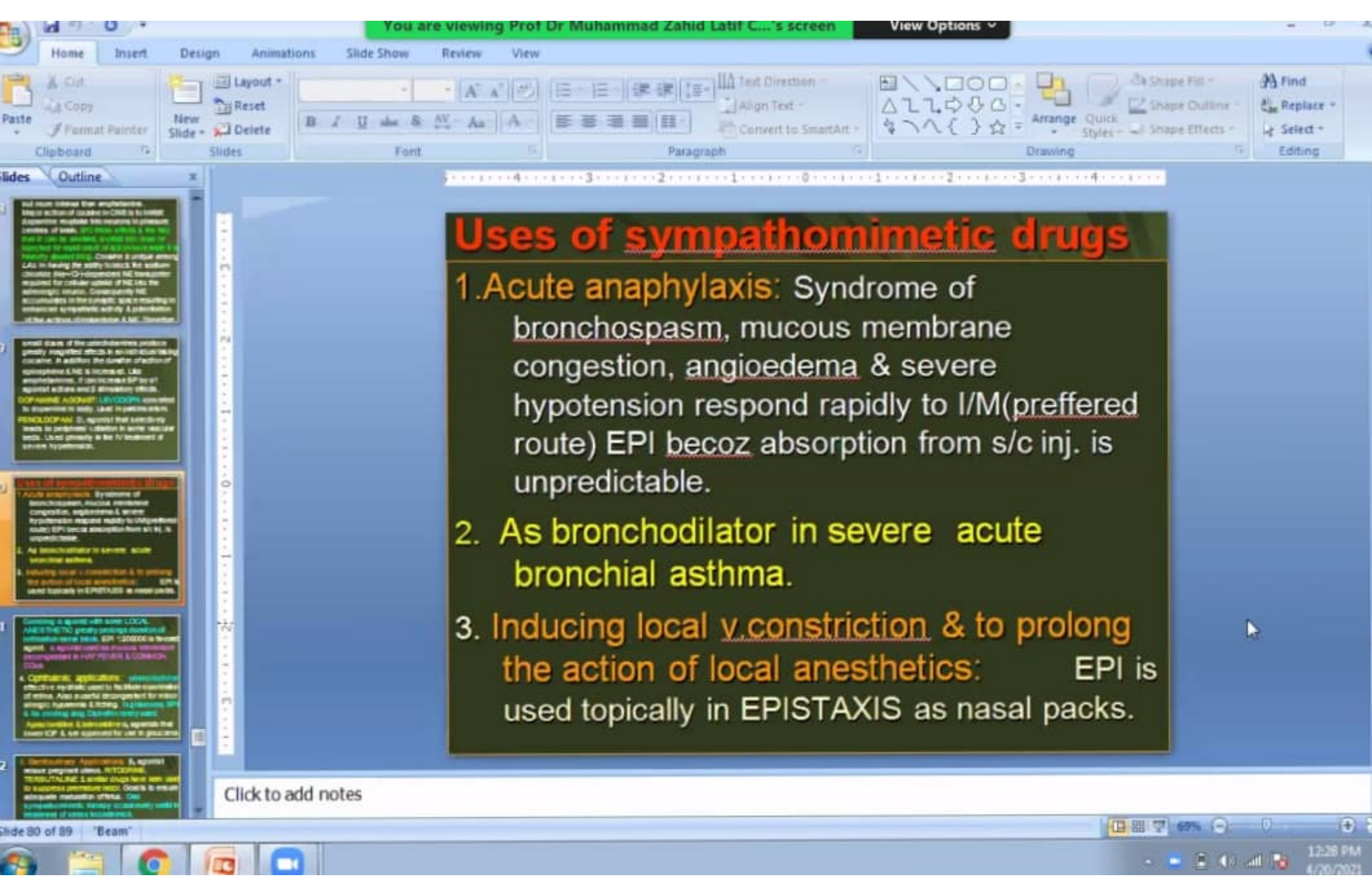

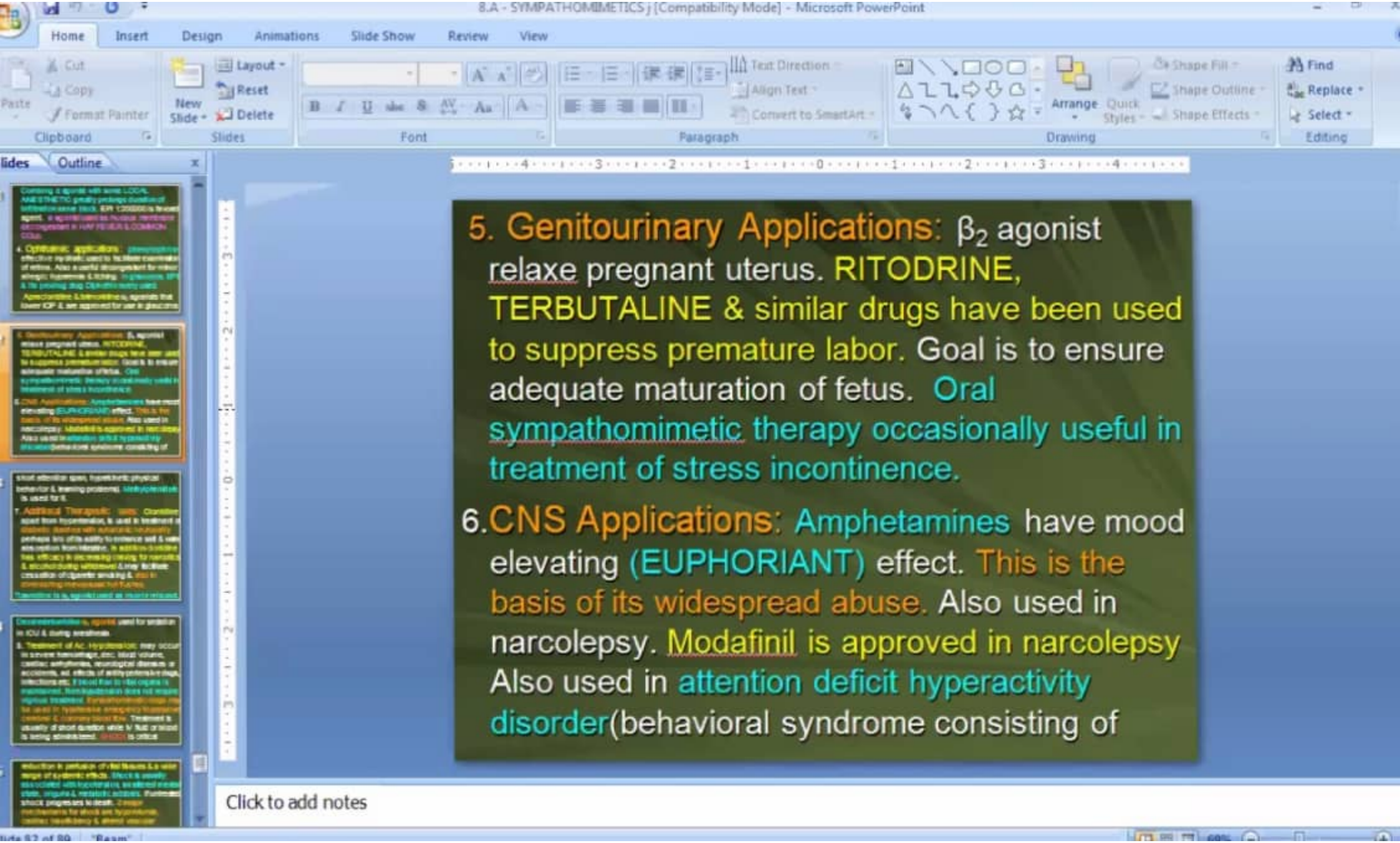

short attention span, hyperkinetic physical behavior & learning problems). Methylphenidate is used for it.

7. Additional Therapeutic uses: Clonidine apart from hypertension, is used in treatment of diabetic diarrhea with autonomic neuropathy perhaps b/o of its ability to enhance salt & water absorption from intestine. In addition clonidine has efficacy in decreasing craving for narcotics & alcohol during withdrawal & may facilitate cessation of cigarette smoking & also in diminishing menopausal hot flushes.

Tizanidine is α_2 agonist used as muscle relaxant.

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