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Slides Outline

9 In HIV Mothers

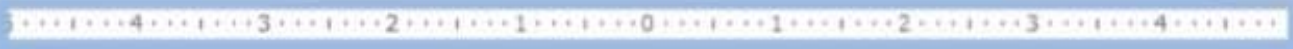
10 Mechanisms of Development of Drug Resistance

11 These bacterial genes encode resistance to an antimicrobial drug. Resistance is genetic.

12 Drug Resistance

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In HIV Mothers

5

Treatment of the mother with *zidovudine* to protect the fetus in the case of an HIV-infected, pregnant woman.



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Slides Outline

1. Pathogenic Clostridia

2. Microscopic Heart Diagram

3. Dental Infections

4. In Close Contacts


5. Prior to Surgery

6. In IVU Patients

Prior to Surgery

4

Treatment prior to certain surgical procedures (such as bowel surgery, joint replacement, and some gynecologic interventions) to prevent infection.



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Slides Outline

1. Drug Resistance Class

2. Microscopic Heart Diagram

3. Dental Infections

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5. Prior to Surgery

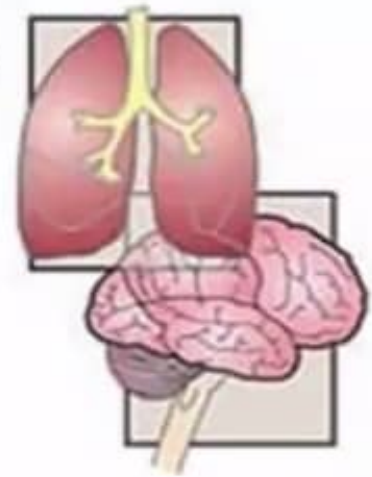
6. In IVU Patients

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In Close Contacts

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Prevention of tuberculosis or meningitis among individuals who are in close contact with infected patients.



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Slides Outline

- 1. Dental Extraction
- 2. Pretreatment of patients undergoing dental extractions who have implanted prosthetic devices, such as artificial heart valves, to prevent seeding of the prosthesis.
- 3. In Close Contacts
- 4. Prior to Surgery
- 5. In IVU Patients

Dental Extraction

2

Pretreatment of patients undergoing dental extractions who have implanted prosthetic devices, such as artificial heart valves, to prevent seeding of the prosthesis.



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Rheumatic Heart Disease

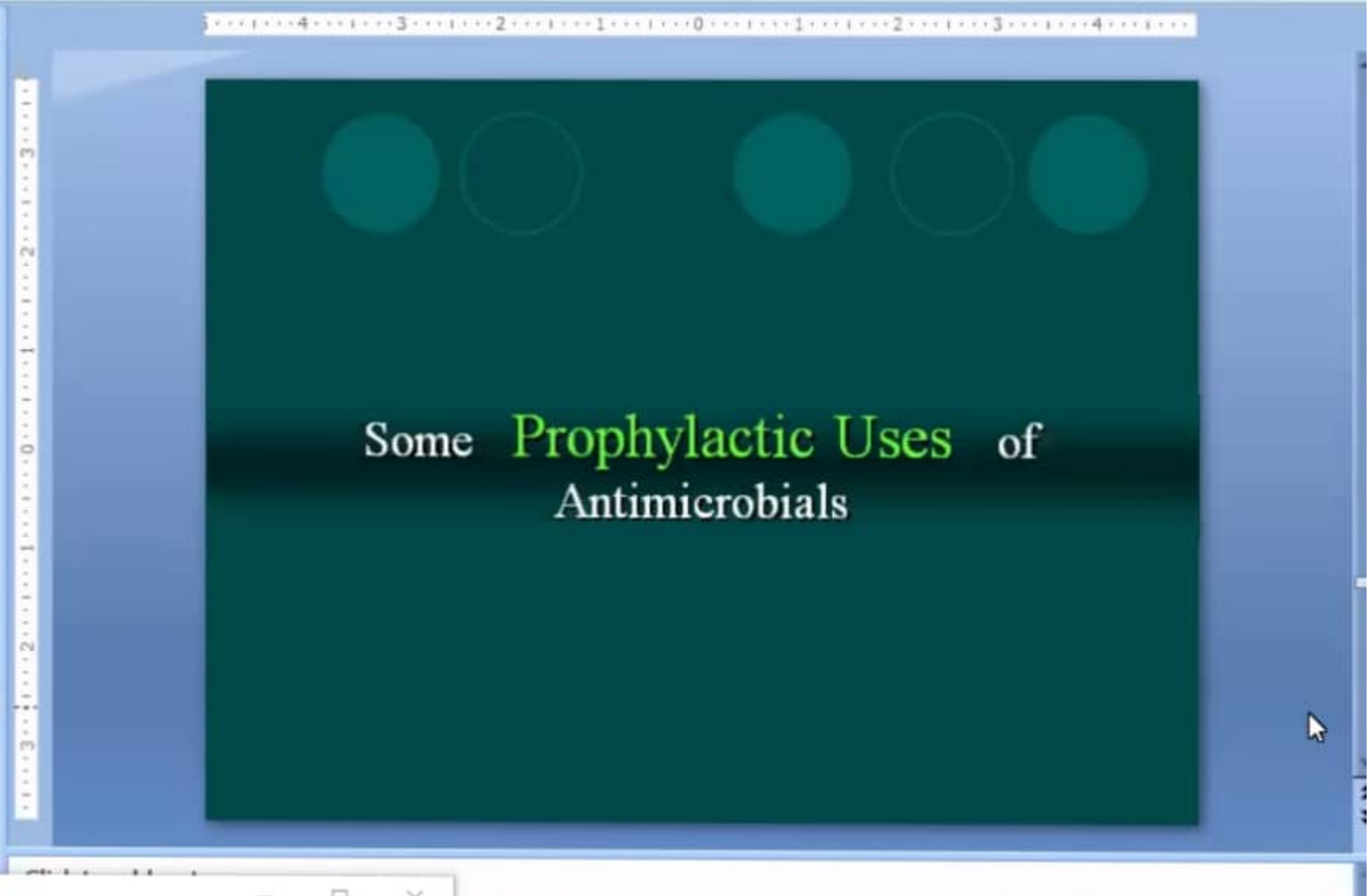
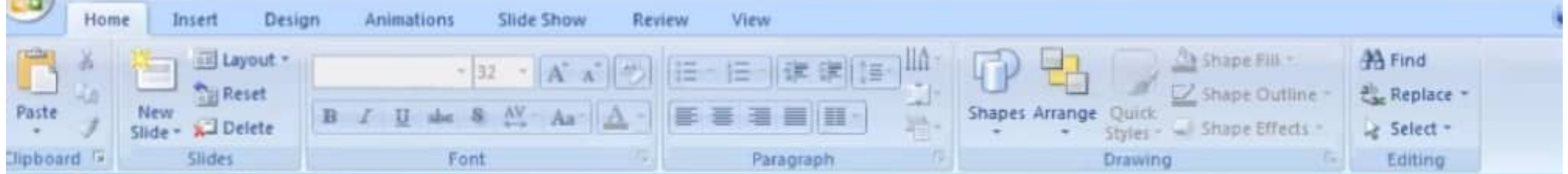
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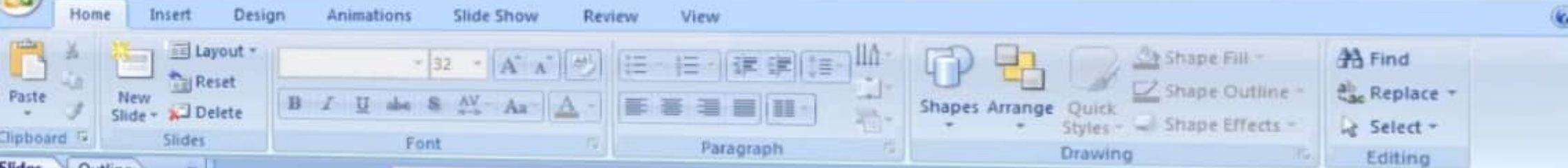
Prevention of streptococcal infections in patients with a history of rheumatic heart disease. Patients may require years of treatment.



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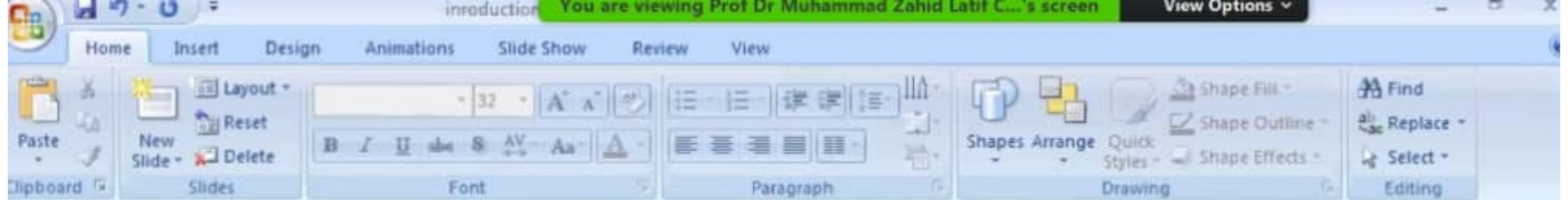
- 1. Pathophysiology of Rheumatic Heart Disease
- 2. Rheumatic Heart Disease**
- 3. Clinical Features
- 4. Microbiology
- 5. Pathogenesis
- 6. Prevention
- 7. Treatment
- 8. Prognosis
- 9. Summary





Antibiotics can be used in 2 ways:

- 1. Empiric therapy:** Antibiotic must cover all the likely organisms. So a combination or a broad spectrum agent may be used. Used only in some situations. When culture report is available, antimicrobial agent should be changed accordingly.
- 2. Definitive therapy:** When microorganism is identified, specific antibacterial agents r given.



Duration of the effect can be prolonged by

1. Use of higher doses,
2. Combination with probenecid.
3. Intramuscular administration *in depot form* with substances containing a positively charged amino group (procaine; clemizole, an antihistamine; benzathine, dicationic).

(Depending on the substance, release of penicillin from the depot occurs over a variable interval.)

Introduction to antimicrobial agents | Compatibility Mode - Microsoft PowerPoint

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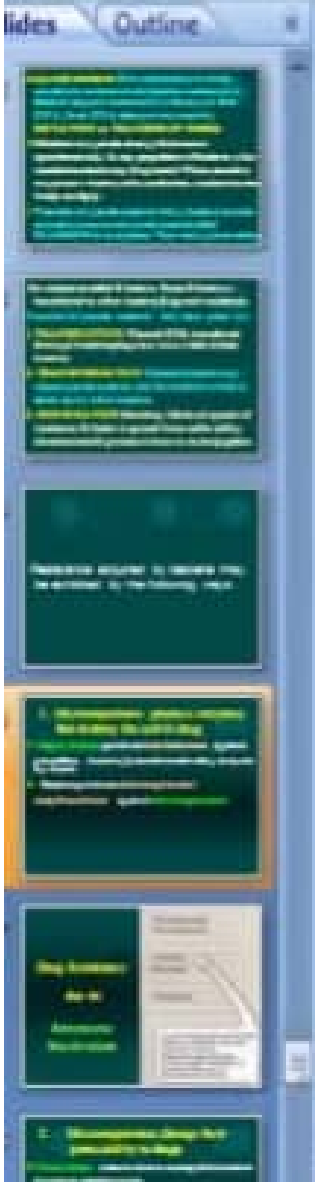
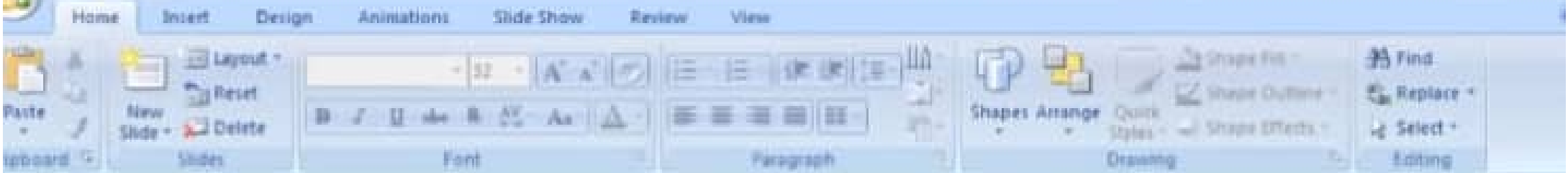
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2. Microorganisms change their permeability to drugs

- Tetracyclines *accumulate in susceptible bacteria but not in resistant ones*
- Polymixins: *change in permeability*
- Aminoglycosides: *natural barrier in streptococci, this can be partly overcome by the presence of a cell wall inhibitor.*

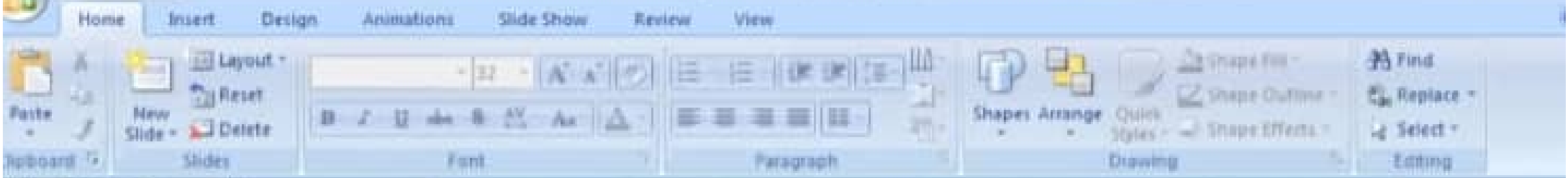
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1. Microorganisms produce enzymes that destroy the active drug

- **Staphylococci** produce beta lactamases against penicillins. Aminoglycoside inactivating enzyme by E.coli.
- Bacteria produce chloramphenicol acetyltransferase against chloramphenicol



The main slide content area has a dark green background. At the top, there are five teal-colored circles arranged horizontally. Below these circles, the text "Resistance acquired by bacteria may be exhibited by the following ways" is written in a white, sans-serif font. The text is centered and occupies the middle portion of the slide. The overall layout is clean and professional.

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Slides Outline

for resistance called R factors. These R factors r transferred to other bacteria & spread resistance.

Transfer of genetic material may take place by:

- 1. TRANSDUCTION:** Plasmid DNA transferred through bacteriophage ie a virus which infects bacteria.
- 2. TRANSFORMATION:** Resistant bacteria may release genetic material into the medium which is taken up by other bacteria.
- 3. CONJUGATION:** Most imp. Mode of spread of resistance. R-factor is spread from cell to cell by direct contact & process is known as conjugation.

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Slide 84 of 97 "Watermark"

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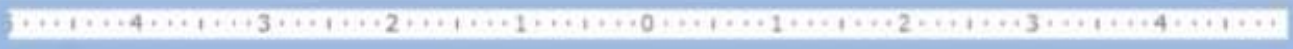
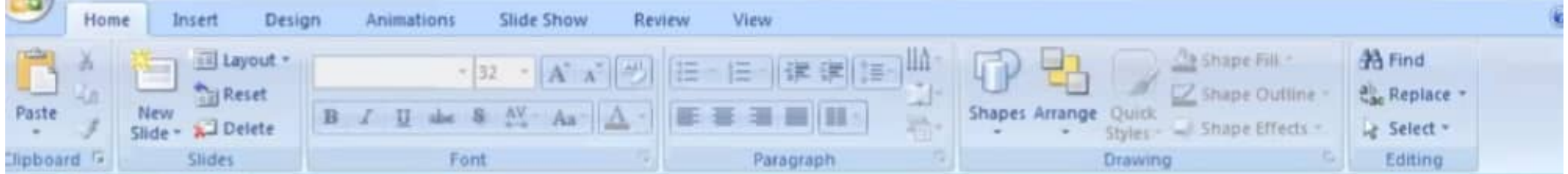
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Chat

Slide 02 of 07

Acquired resistance: Here microbes previously sensitive to antimicrobials become resistant to it. Bacteria acquire resistance by a change in their DNA. Such DNA changes may occur by **MUTATION** or **TRANSFER OF GENES**.

- Mutation is a genetic change that occurs spontaneously. In any population of bacteria, a few resistant mutants may be present. When sensitive organism is destroyed by antibiotics, resistant mutant freely multiply.
- Transfer of genetic material. Many bacteria contain extrachromosomal genetic material called **PLASMIDS** in cytoplasm. They carry genes coding



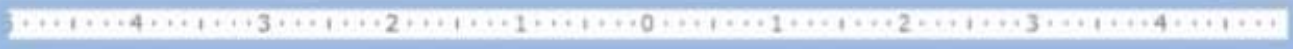
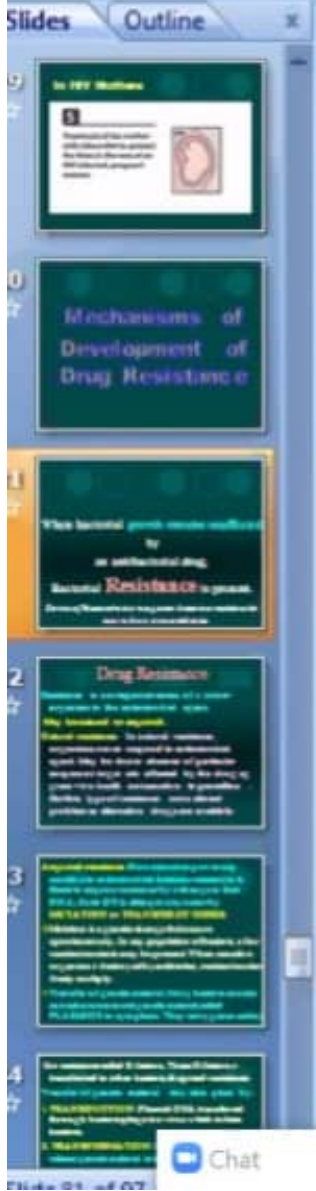
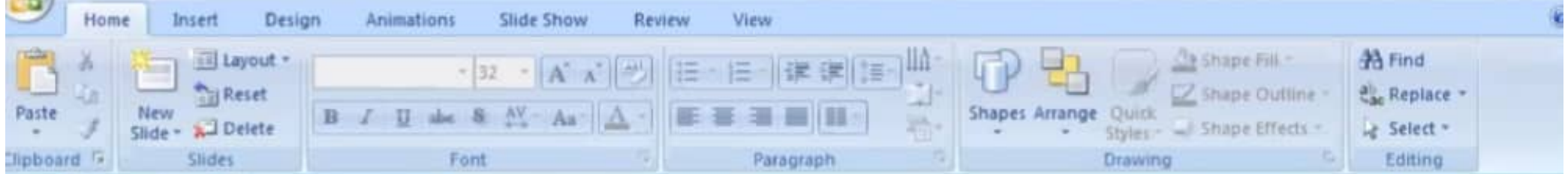
Drug Resistance

Resistance is unresponsiveness of a micro-organism to the antimicrobial agent.

May be natural or acquired.

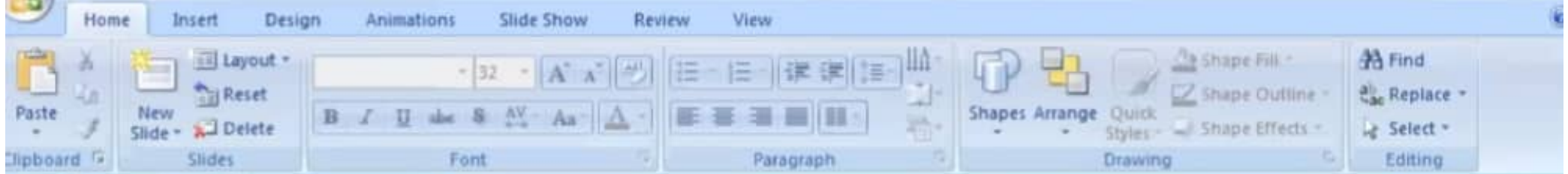
Natural resistance: In natural resistance, organisms never respond to antimicrobial agent. May be due to absence of particular enzyme or target site affected by the drug eg gram -ive bacilli not sensitive to penicillins. But this type of resistance not a clinical problem as alternative drugs are available.





When bacterial growth remains unaffected by an antibacterial drug, Bacterial **Resistance** is present. *Some of these strains may even become resistant to more than one antibiotic.*





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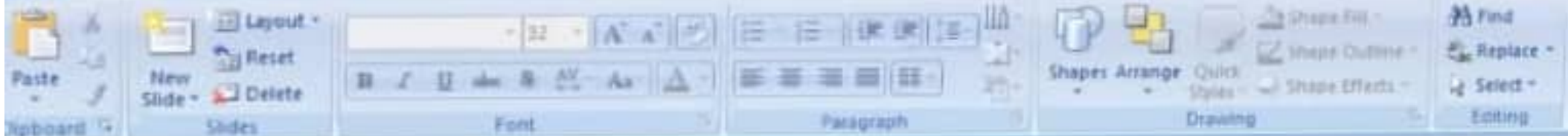
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Mechanisms of Development of Drug Resistance

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CROSS RESISTANCE is resistance seen among chemically related drugs. When a micro-organism develops resistance to one drug, it is also resistant to other drugs of same group even when not exposed to them eg resistance to one tetracycline means resistance to all tetracyclines.

PREVENTION OF RESISTANCE TO ANTIMICROBIALS:

1. Antibiotics used only when necessary.
2. **Selection of appropriate antibiotic is absolutely important.**
3. Correct dose & duration of treatment.
4. **Combination of drugs should be used as in TB to delay the development of resistance.**



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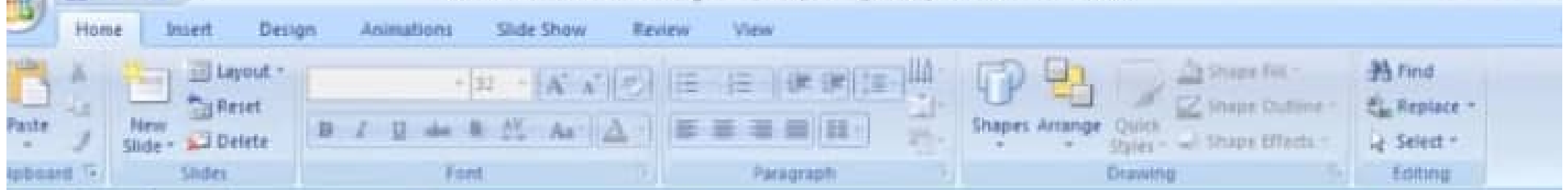
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4. Microorganisms develop altered metabolic pathways

Bacteria may produce folic acid by an alternative pathway and develop resistance against antifols & nucleic acid synthesis inhibitors.

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3. Microorganisms develop an altered target for the drug
Binding site may be altered eg

- a) binding site for aminoglycosides on ribosomes may be altered.
- a) Altered receptor site on 50 S for erythromycin
- b) Alteration or loss of PBPs for penicillins & cephalosporins

introduction You are viewing Prof Dr Muhammad Zahid Latif C... 's screen View Options

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become pathogens.

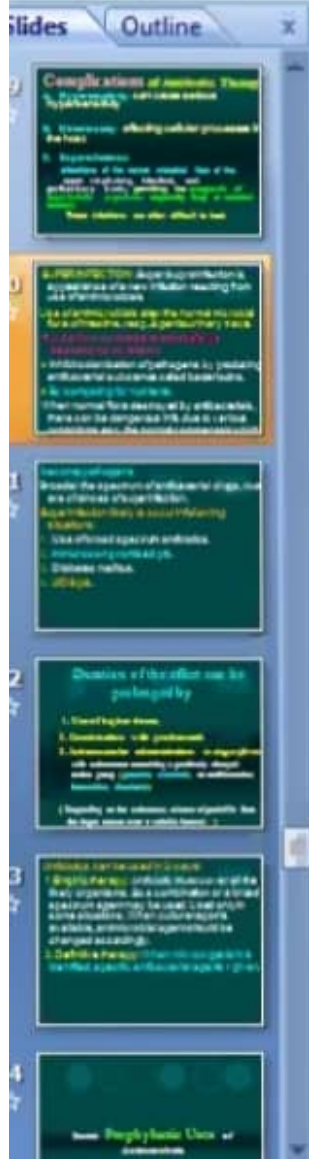
Broader the spectrum of antibacterial drugs, more are chances of superinfection.

Superinfection likely to occur in following situations:

1. Use of broad spectrum antibiotics.
2. Immunocompromised pts.
3. Diabetes mellitus.
4. AIDS pts.

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Participants Chat Share Screen Record Reactions



SUPERINFECTION: Super/suprainfection is appearance of a new infection resulting from use of antimicrobials

Use of antimicrobials alter the normal microbial flora of intestine, resp., & genitourinary tracts.

Normal flora contribute to host defence mechanisms as follows:

- Inhibit colonization of pathogens by producing antibacterial substance called bacteriocins.
- By competing for nutrients.

When normal flora destroyed by antibacterials, there can be dangerous infs. due to various organisms esp. the normal commensals which

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