



King Saud University  
College of Medicine  
1<sup>st</sup> Year, 2<sup>nd</sup> block

# Diseases Modifying Anti-Rheumatic Drugs



## Musculoskeletal Block

# Objectives

Define DMARDs

Describe the classification of this group of drugs

List some examples of drugs related to DMARDs.

Describe the general advantages & criteria of this group of drugs

Describe the mechanism of action , specific clinical uses , adverse effects & contraindications of individual drugs.

Describe the general clinical uses

# General Features & Conditions to use Antirheumatic

Used when the disease is progressing & causing deformities

Low doses are commonly used early in the course of the disease

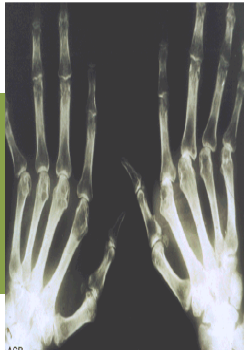
Have no analgesic effects (not directly) but they reduce pain because they are anti-inflammatory (when inflammation is reduced the pain is reduced too)

Slow onset their effects take from 6 weeks up to 6 months to be evident

Used when the inflammatory disease is not responding to NSAIDs

## General Clinical Uses

Can not repair the existing damage (not treating), but prevent further deformity



Treatment of rheumatic disorders

Combination therapies are both safe & efficacious



# Types of Anti-rheumatic drugs

Non Biologic disease modifiers (Old drugs)

Biologic disease modifiers

Genetically engineered drugs that are used to modify imbalances of the immune system in autoimmune diseases. (they make these drugs in the laboratories by genetic modification )

What are they ?

Types

agents block, or modify the activity of selected cells in the immune system ( **Directly affecting the cell** )

T-cell modulating drug	Abatacept
B-cell cytotoxic agent	Rituximab

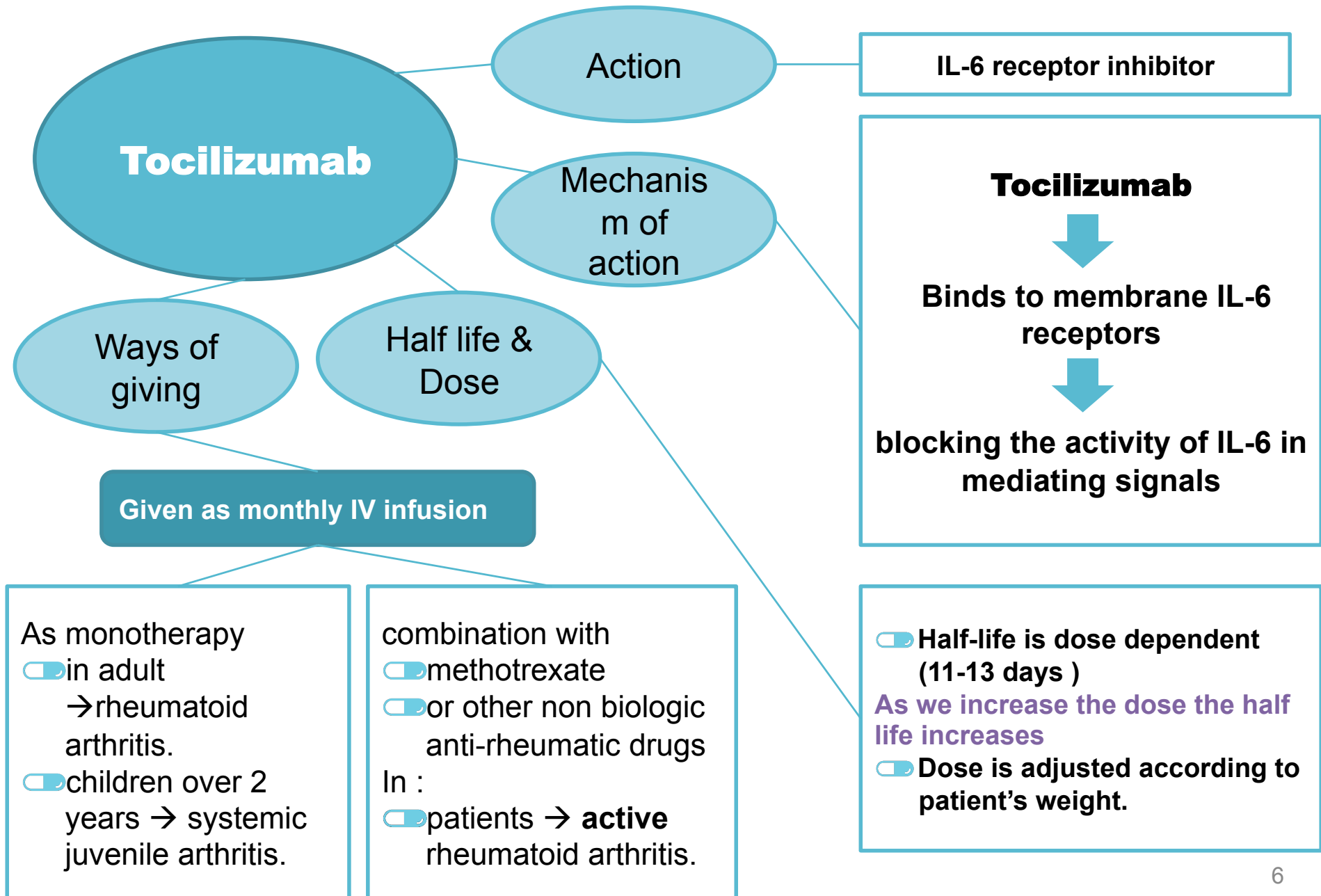
Or blocking certain messenger proteins known as cytokines , that send signals between those cells. ( **block communication between the cells** )

Anti-IL-6 receptor antibody	Tocilizumab
TNF- blocking agents	Infliximab

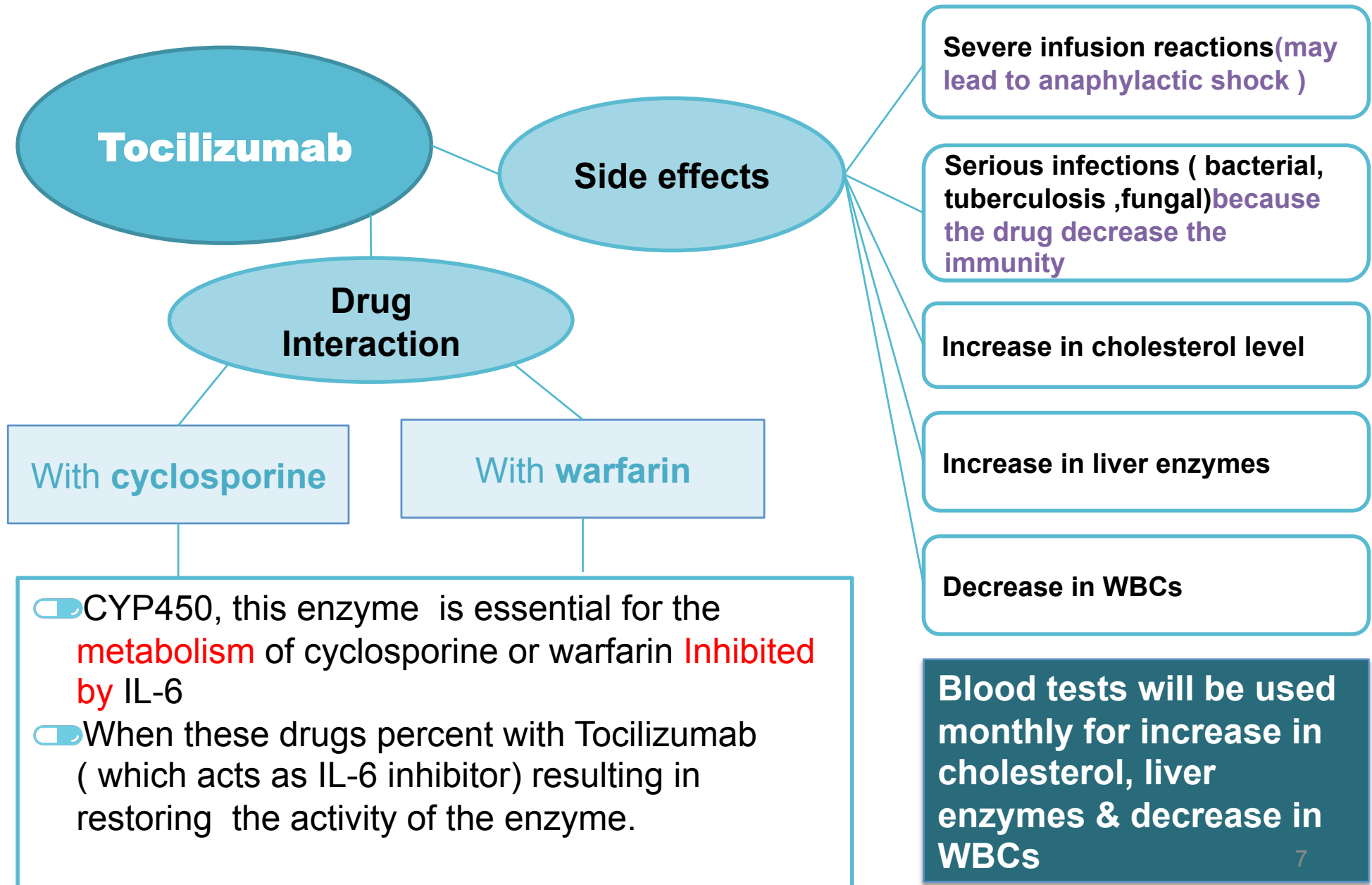
# FIRST :NON BIOLOGIC DISEASE MODIFIERS(OLD DRUGS)

Name of the drug	Mechanism of action	Pharmacokinetics and features	Adverse Effects
<p>Hydroxychloroquin e</p> <p><b>Note:</b> when we give this drug we do vision examinations to avoid side effects .</p>	<ul style="list-style-type: none"> <li>☑ Trapping free radicals(anti oxidant ).</li> <li>☑ Suppression of T lymphocyte cells.</li> <li>☑ Stabilization of lysosomal enzyme activity.</li> </ul>	<ul style="list-style-type: none"> <li>☑ Rapidly &amp; completely absorbed following oral administration.</li> <li>☑ Penetrates into C.N.S. &amp; traverse the placenta ( that's why this drug isn't given to pregnant women)</li> <li>☑ Metabolized → liver</li> </ul>	<ul style="list-style-type: none"> <li>☑ Pruritus</li> <li>☑ GIT upset (Nausea &amp; vomiting)</li> <li>☑ Discoloration of nail beds &amp; mucous membranes</li> <li>☑ Headaches</li> <li>☑ Blurred vision (Corneal deposits)</li> <li>☑ Irreversible retinal damage ( the most dangerous side affect)</li> </ul>
<p>Methotrexate (anti cancer drug , inhibit the growth of cancer cells )</p>	<ul style="list-style-type: none"> <li>☑ Inhibition of T-Cells ( cell-mediated immune reactions)</li> <li>☑ Inhibition of polymorpho-nuclear chemotaxis</li> </ul>	<ul style="list-style-type: none"> <li>☑ Immunosuppressant drug</li> <li>☑ Used mainly as chemotherapy for cancer treatment</li> <li>☑ The doses needed as anti-rheumatic are much lower than those needed in cancer chemotherapy</li> <li>☑ Given once a week</li> </ul>	<ul style="list-style-type: none"> <li>☑ Nausea</li> <li>☑ Liver cirrhosis (ONLY with chronic administration of the drug) &amp; Hepatotoxicity</li> <li>☑ Acute pneumonia –like syndrome (result from Cytopenia)</li> <li>☑ Mucosal ulceration.(GIT)</li> <li>☑ bone marrow depression →Cytopenia.(reduction in the number of BC)</li> </ul> <p>(Mucosal ulceration and Cytopenia are the most dangerous side effects)</p>

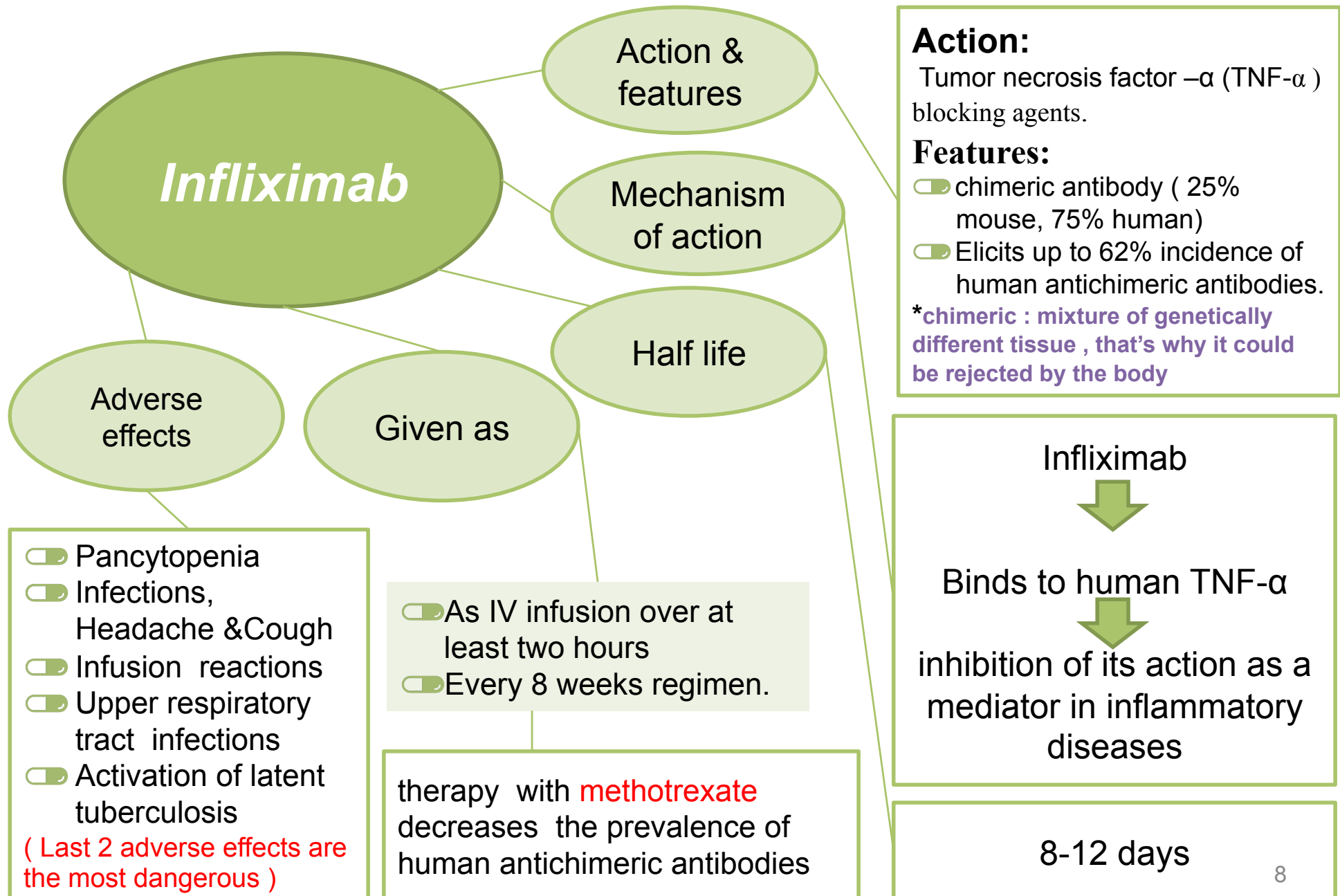
# SECONDS: BIOLOGIC DISEASE MODIFIERS(NEW DRUGS)



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# SECONDS: BIOLOGIC DISEASE MODIFIERS(NEW DRUGS)





# COMPARISON BETWEEN NSAIDS & DMARDS

DMARDSs	NSAIDs
Slow onset of action used in chronic cases when deformity is exciting	Rapid onset of action used in acute cases to relief inflammation & pain
Arrest progression of the disease	No effect
Prevent formation of new deformity	Can not stop formation of new deformity

# SUMMARY

Define DMARDs

Disease –Modifying  
Antirheumatic drugs

**Used when the  
disease is progressing  
& causing deformities**

**prevent further  
deformity and have  
no analgesic effect**

**Describe the  
general clinical uses**

**Treatment of  
rheumatoid arthritis**

**Combination  
therapies**

Describe the classification of this  
group of drugs

**Non Biologic disease  
modifiers(Old drugs)**

**Biologic disease  
modifiers**

Describe the general advantages &  
criteria of this group of drugs

- used in chronic cases when deformity is exciting
- Arrest progression
- Prevent formation of new deformity
- **Have no analgesic effects**
- **Slow onset**

**Know some  
examples of drugs  
related to DMARDs.**

OLD drugs:

Hydroxychloroquine  
Methotrexate

New drugs:

Tocilizumab  
Infliximab

**Describe the mechanism of action , specific clinical uses ,  
adverse effects &contraindications of individual drugs.**

- Hydroxychloroquine acts mainly through suppression of the activity of lysosomal enzymes and trapping free radicals
- Its main adverse effects is irreversible retinal damage & hepatic toxicity.

- Methotrexate acts mainly through suppression of phagocytic cells & T cells- Its adverse effects are bone marrow depression & mucosal ulceration

- Infliximab is a chimeric TNF- $\alpha$  blocking agent
- Given with methotrexate to reduce antichimeric effect

# MCQS

**1- Which drug is used with special precautions to guard against the development of irreversible retinopathy:**

- a) Methotrexate
- B) Infliximab
- C) Hydroxychloroquine
- d) rituximab

**2-inhibition of polymorphonuclear chemotaxis is the mechanism of action in which DMARDs**

- a) methotrexate
- b) Hydroxychloroquine
- c) Infliximab.
- d) Tocilizumab

**3- Drug Its main adverse effects are upper respiratory tract infections & reactivation of latent TB:**

- a) Infliximab
- b) Tocilizumab
- c) Methotrexate
- d) Hydroxychloroquine

**4- which of the following Biologic disease modifiers that works Directly affecting the cell :**

- a) rituximab
- b) Infliximab
- c) Abatacept
- d) Both a & c

**5- which of the following DMARDs is used with high doses as anti cancer drug ?**

- a) Hydroxychloroquine
- b) Methotrexate
- c) Tocilizumab
- d) Infliximab

**6- Blood tests will be used monthly for increase in cholesterol, liver enzymes & decrease in WBCs :**

- a) Hydroxychloroquine
- b) Methotrexate
- c) Tocilizumab
- d) Infliximab

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