

# **LABORATORY ISSUES OF HIV TEST**

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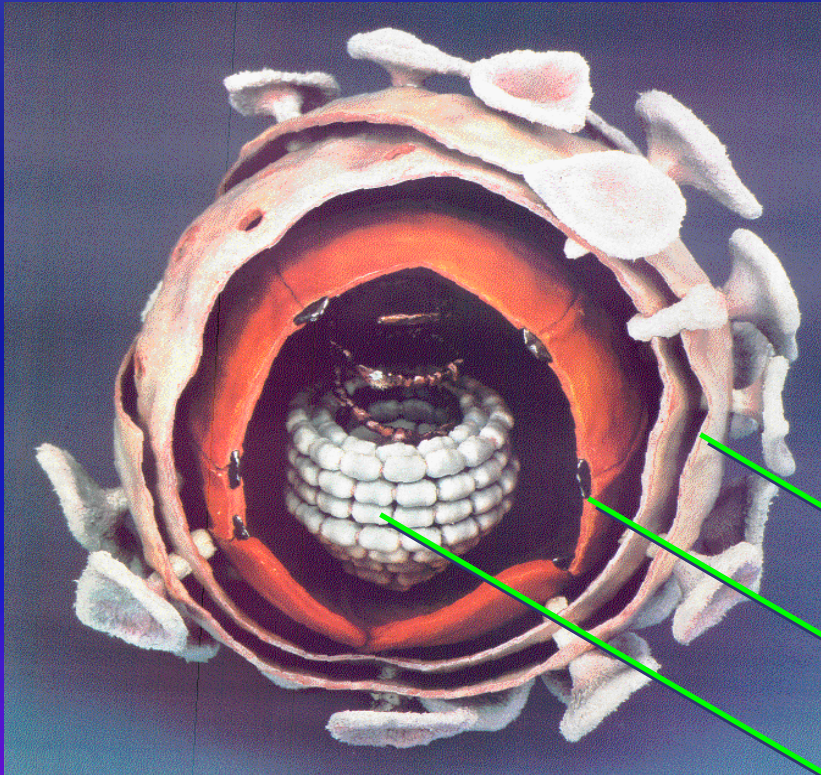
# Overview

- ◆ **Test indication**
- ◆ **HIV structure and antigens**
- ◆ **Seroconversion**
- ◆ **Testing strategies**
- ◆ **Choosing test kits**
- ◆ **Important issues in HIV testing**
- ◆ **Problems encountered**

# HIV testing indication

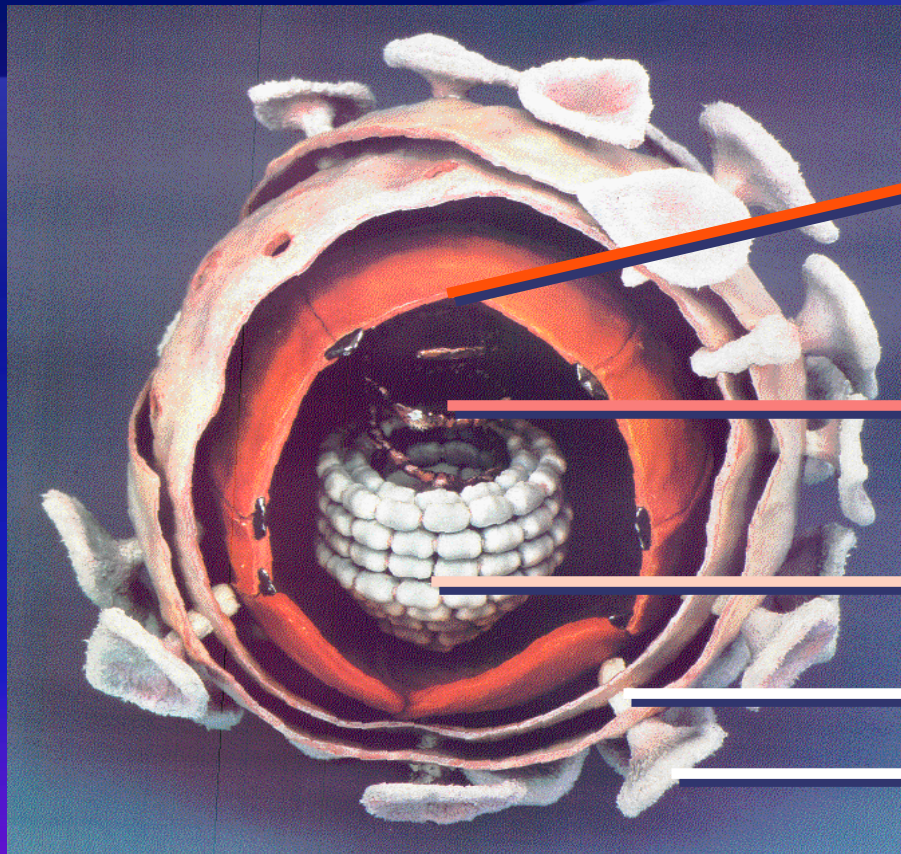
- ◆ **Blood transfusion and organ transplant donor screening**
- ◆ **Surveillance**
- ◆ **Diagnosis**

# Human Immunodeficiency Virus (HIV)



- **Retrovirus**
- **2 ss-RNA**
- **reverse transcriptase**
- **Structure :**
  - envelope**
  - capsid**
  - core**

# HIV antigens



**p17**

**RNA, reverse transcrip-tase,  
endonuclease, protease**

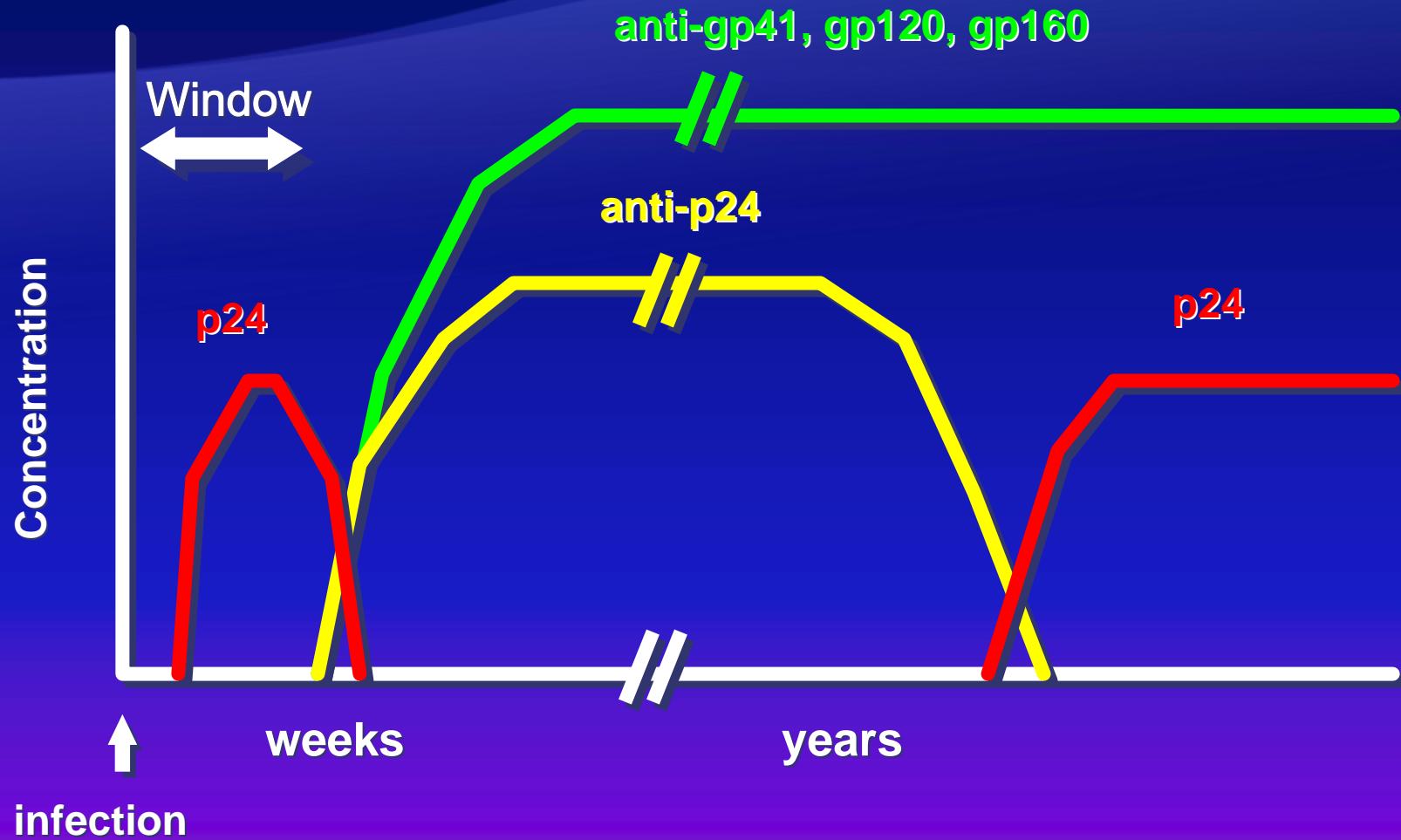
**p24**

**gp41**

**gp120**

**gp160**

# Seroconversion of HIV infection



# Laboratory tests for HIV

- **Virus culture**
- **Antigen detection : p24**
- **Nucleic acid detection : DNA provirus / RNA**
- **Antibody detection : screening & confirmatory**

# Antibody detection

## ✿ Screening :

- ✿ EIA,
- ✿ agglutination
- ✿ immunoconcentration/flow-through
- ✿ immunochromatography/lateral flow

## ✿ Confirmatory :

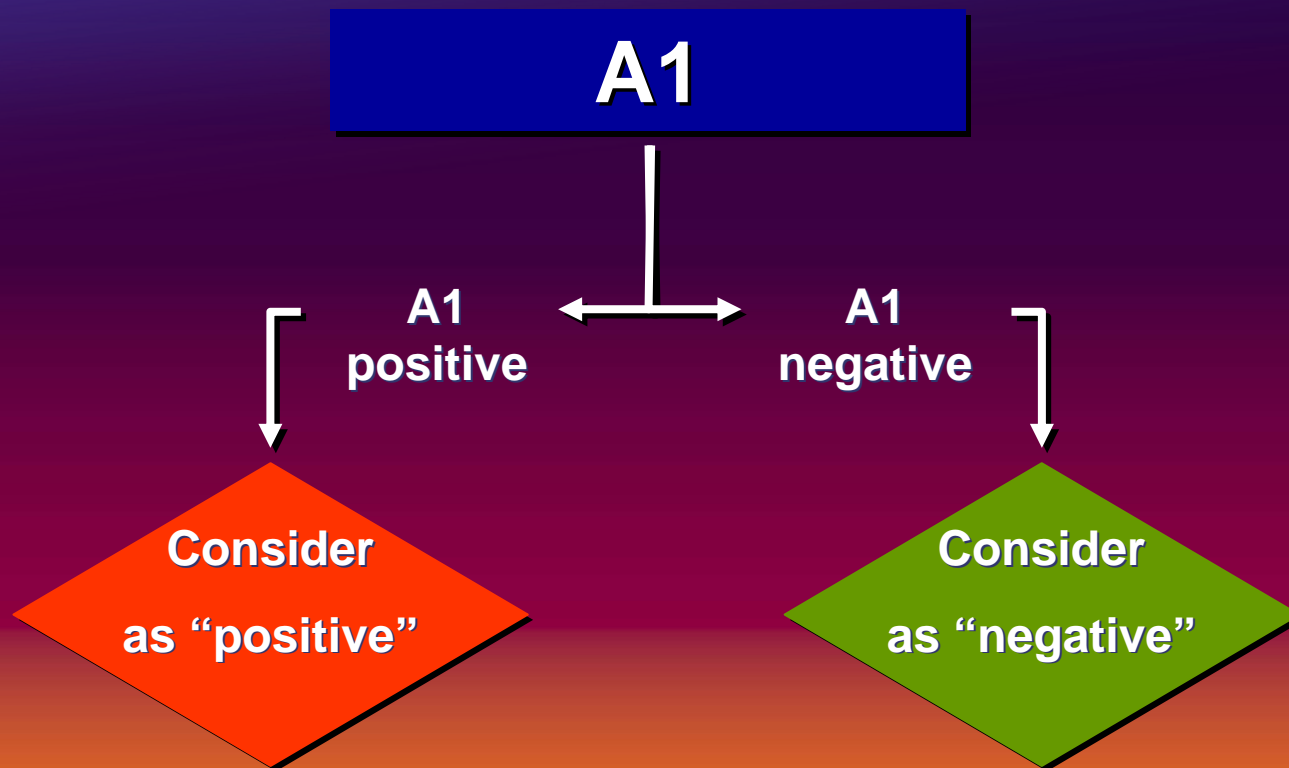
- ✿ Western blot
- ✿ Lineimmunoassay
- ✿ Immunofluorescence
- ✿ Radioimmunoprecipitation assay



# Screening strategies

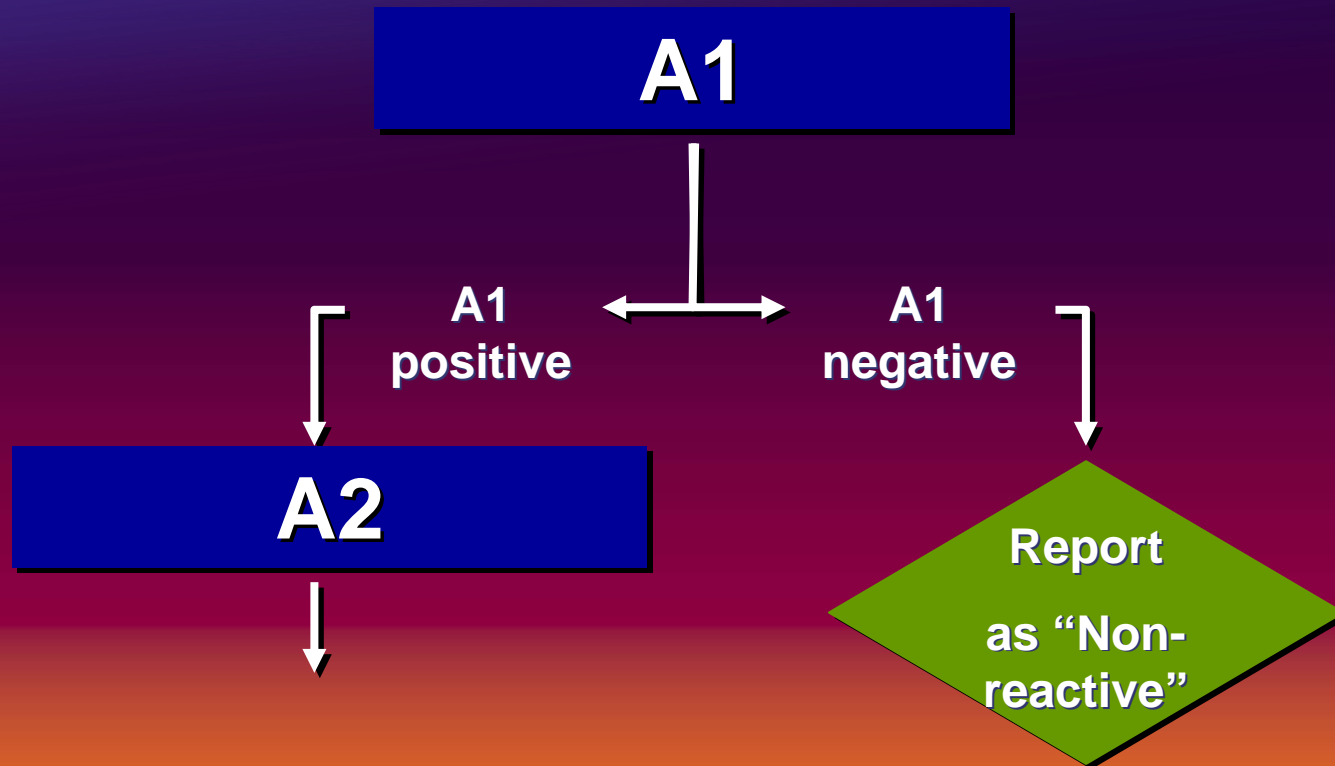
<b>Test aim</b>	<b>Prevalence</b>	<b>Strategy</b>	
<b>Blood donor</b>	<b>All prevalence</b>	<b>I</b>	
<b>Surveillance</b>	<b>&gt; 10 %</b>	<b>I</b>	
	<b>≤ 10 %</b>	<b>II</b>	
<b>Diagnosis</b>	<b>symptomatic</b>	<b>&gt; 30 %</b>	<b>I</b>
		<b>≤ 30 %</b>	<b>II</b>
	<b>asymptomatic</b>	<b>&gt; 10 %</b>	<b>II</b>
		<b>≤ 10 %</b>	<b>III</b>

# Strategy I

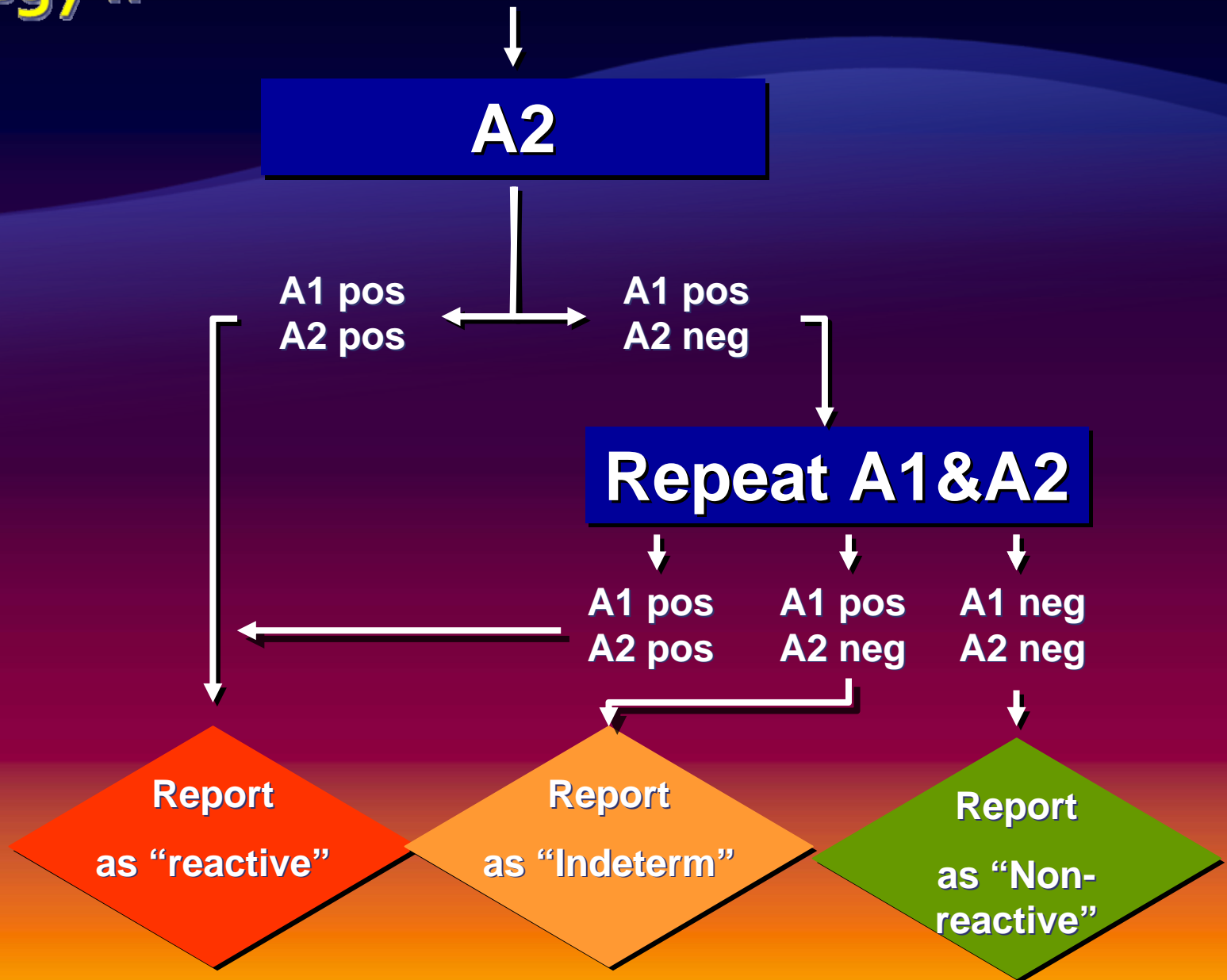


**Do not use !!**

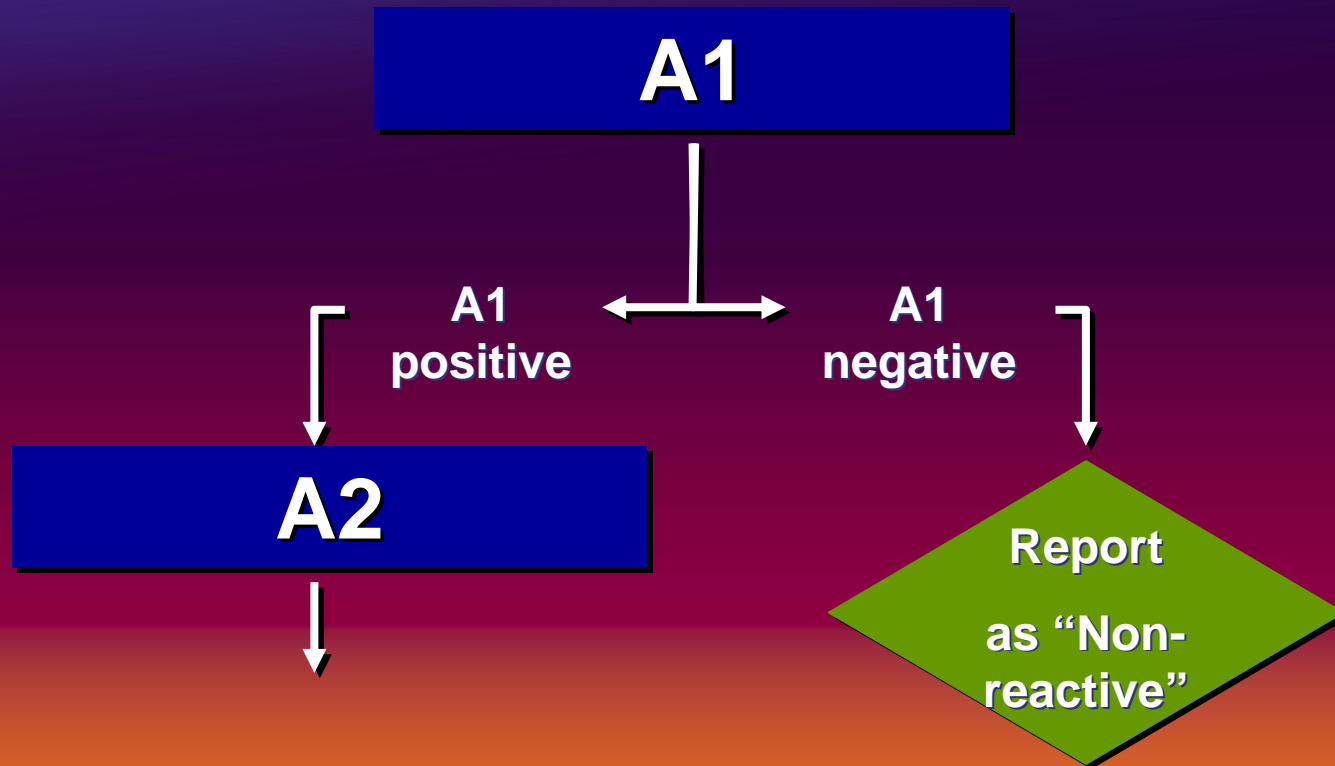
# Strategy II



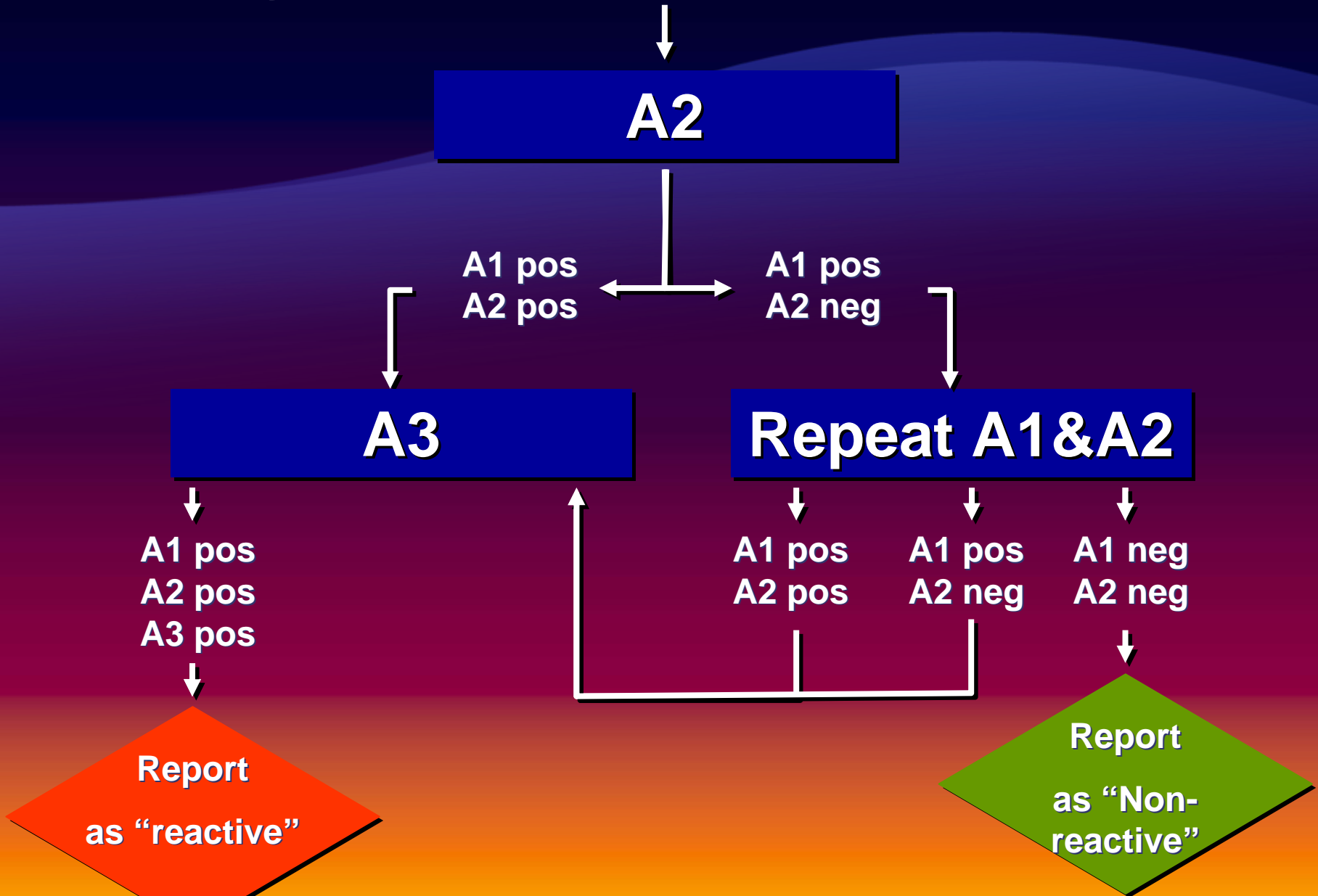
# Strategy II



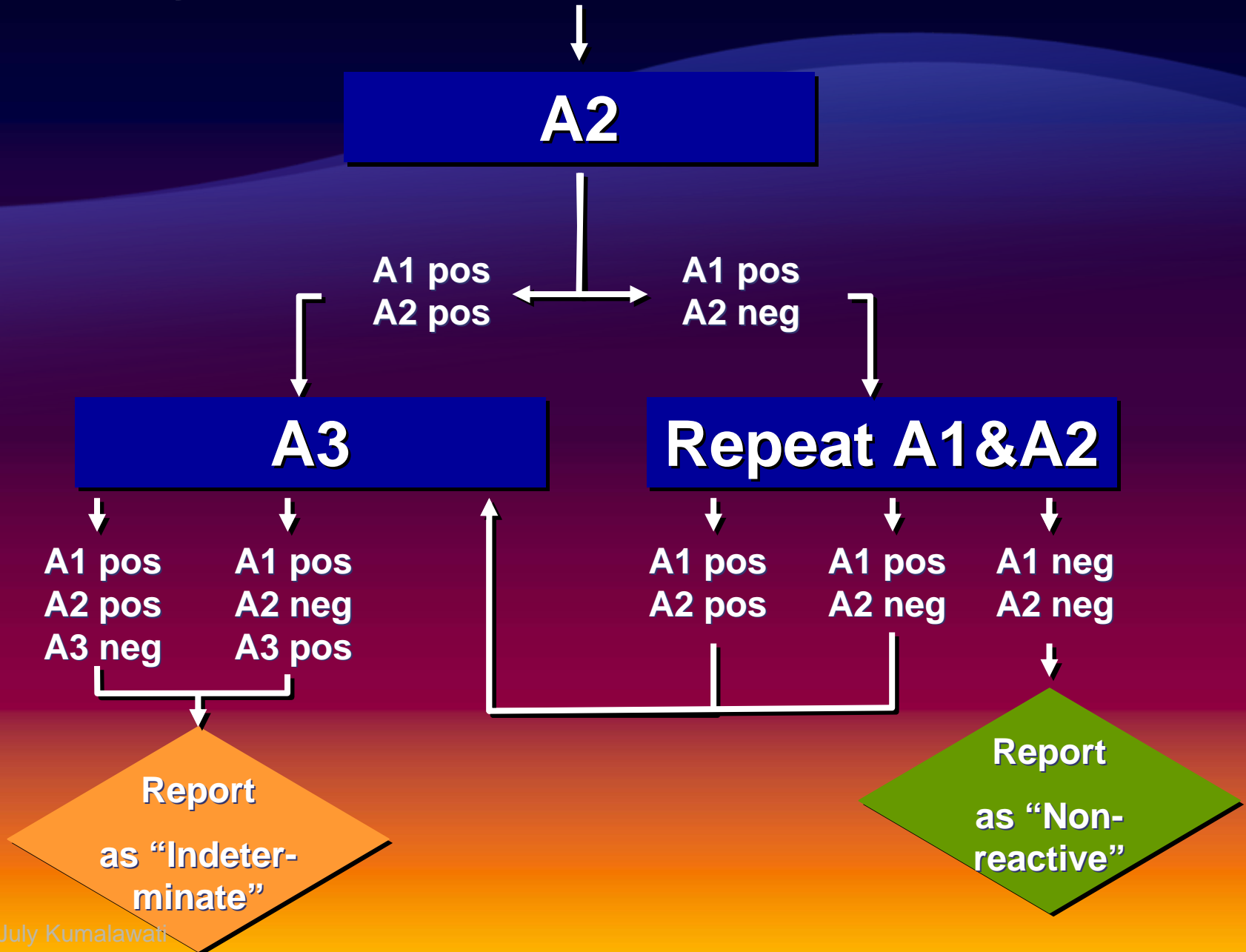
# Strategy III



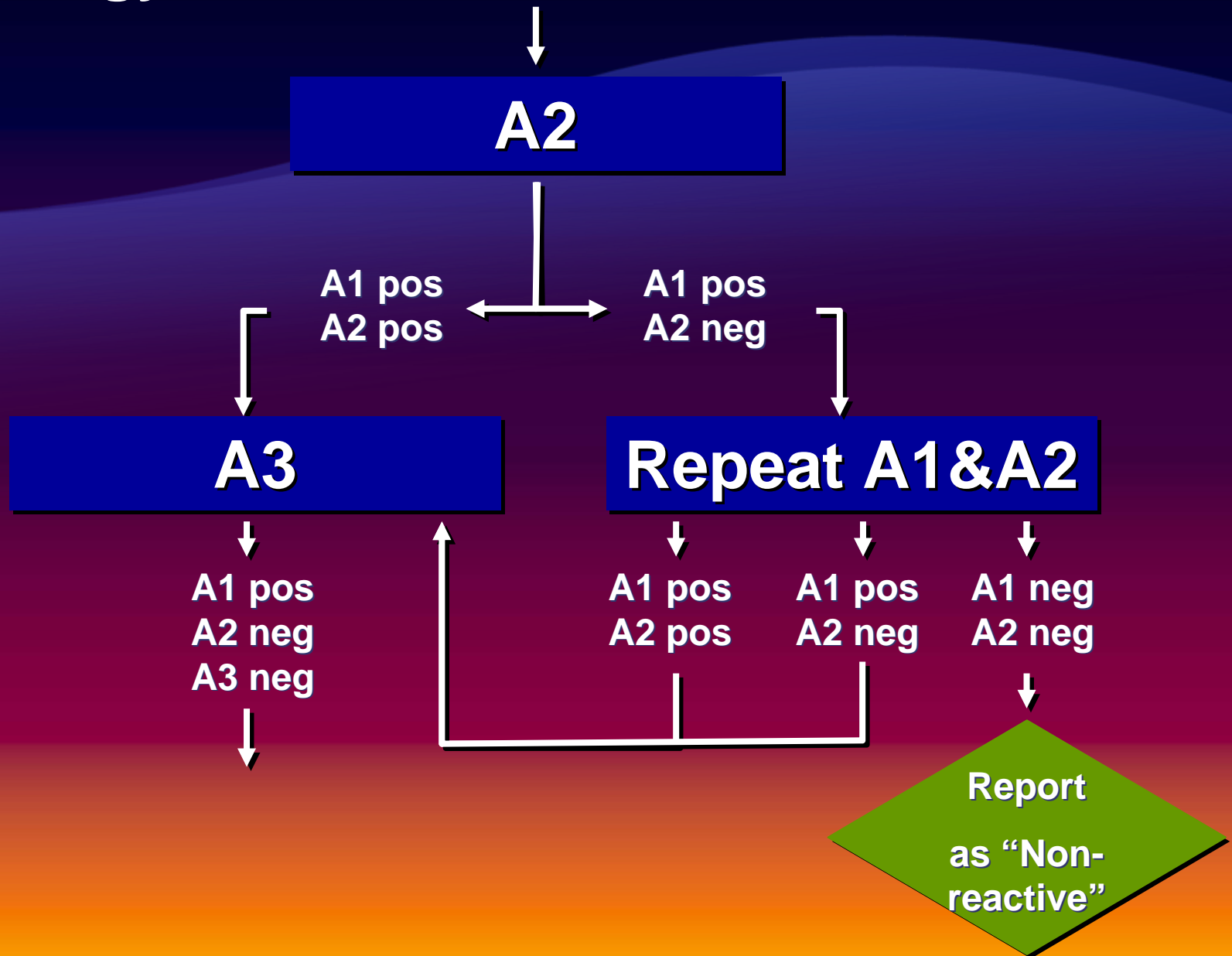
# Strategy III



# Strategy III

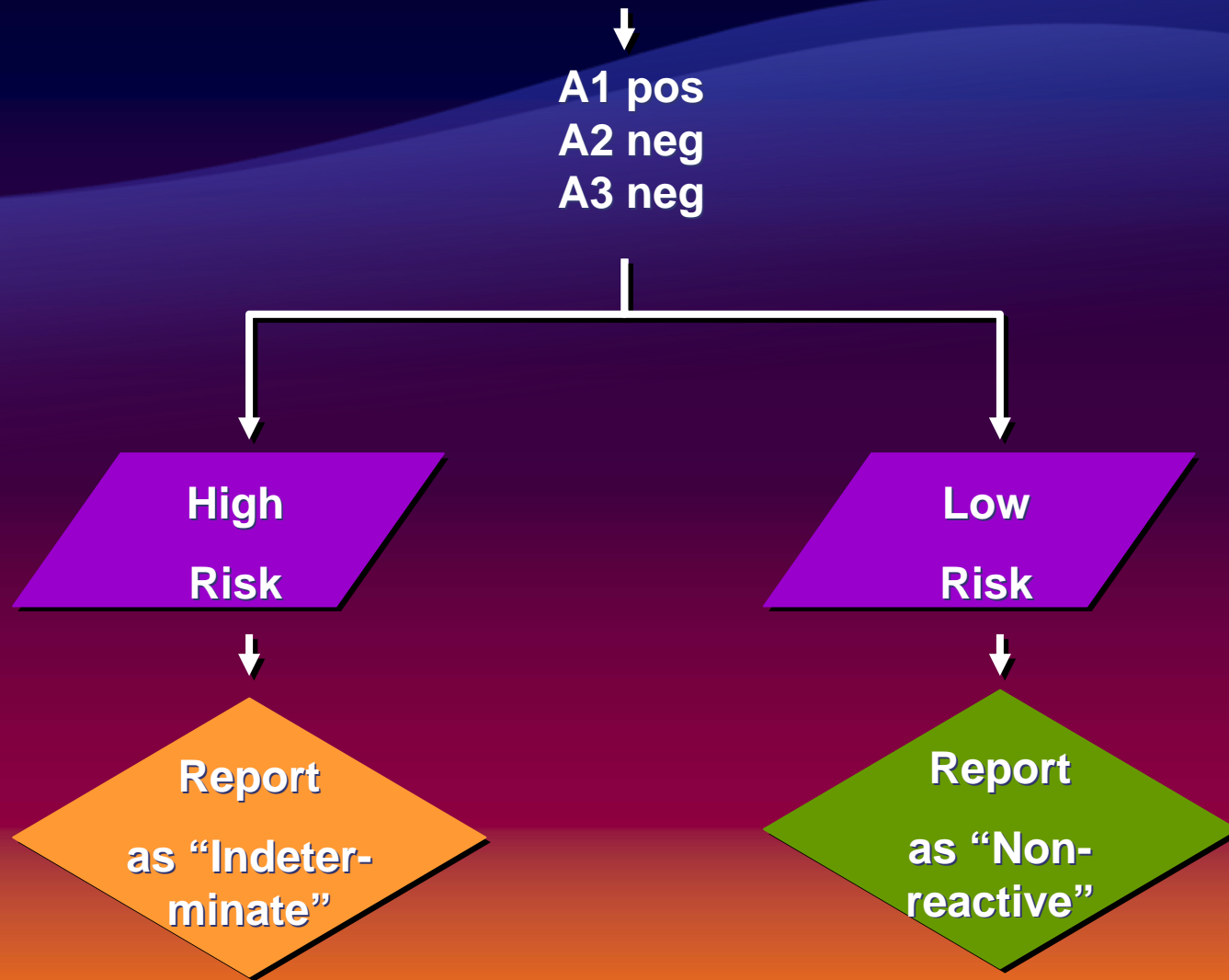


# Strategy III





# Strategy III



# Choosing test kits

- **Transfusion/transplant safety (strategy I) :**
  - Highest sensitivity, preferably  $\geq 99\%$
- **Surveillance (strategy I) :**
  - Specificity  $\geq 95\%$
- **Diagnosis (strategies II & III) :**
  - First : Highest sensitivity (preferably  $\geq 99\%$ )
  - Supplemental (2<sup>nd</sup> & 3<sup>rd</sup>) : higher specificity than the first
  - Different antigen source or preparation

# Test procedure

- ◆ **Follow the package insert's instruction**
- ◆ **Testing strategies II and III can be executed in:**
  - ◆ **Serial sequence**
  - ◆ **Paralel**

# Confirmatory test

- ◆ Only for “indeterminate” and “reactive” specimens
- ◆ Confirmatory test report:
  - ◆ Positive,
  - ◆ Negative, or
  - ◆ Indeterminate

# Important issues in HIV test

- ◆ Pre-test counseling
  - ◆ Informed consent
  - ◆ Post-test counseling
  - ◆ Confidentiality
- 
- ◆ Standard precautions

# When is the test requested?

- ◆ **Voluntary:**
  - ◆ **VCT (Voluntary counseling and testing)**
- ◆ **Provider initiated:**
  - ◆ **PICT (Provider initiated counseling and testing) with 'opt-out' option**

# Problems encountered during HIV test

- ◆ The laboratory does not have the information on the availability of an informed consent
- ◆ In VCT setting:
  - ◆ Serial testing: client may not come back to get the result
  - ◆ Testing may not be done by a laboratory technician

THANK YOU