

**SERO-EPIDEMIOLOGY  
OF VIRAL HEPATITIS  
IN HAEMODIALYSIS PATIENTS  
AND CONTROL MEASURES**

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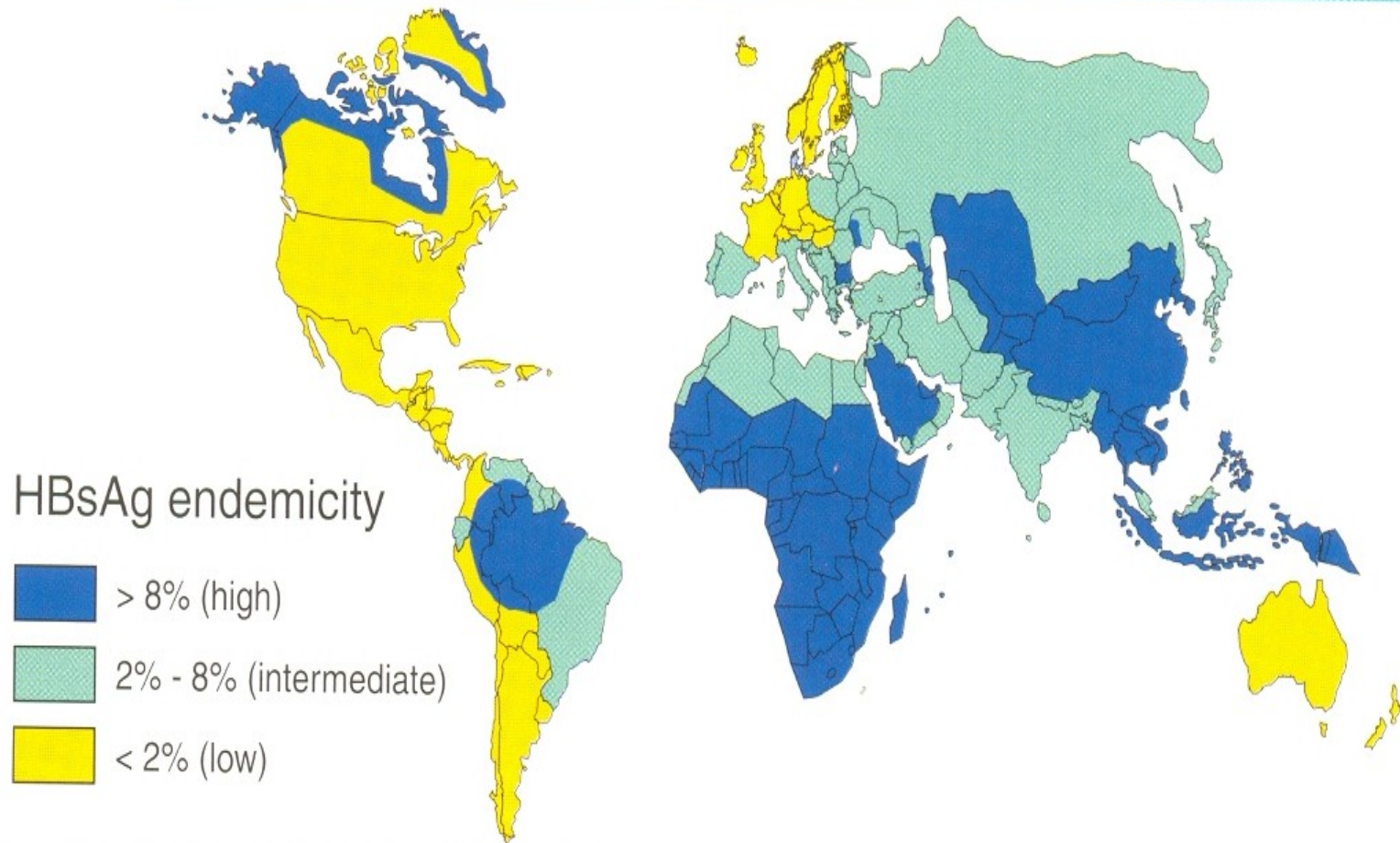
**24-25.03.2011 VHPB COUNTRY MEETING - SOFIA, BULGARIA**

# WHO IS WHO IN VIRUS HEPATITIS ETIOLOGY

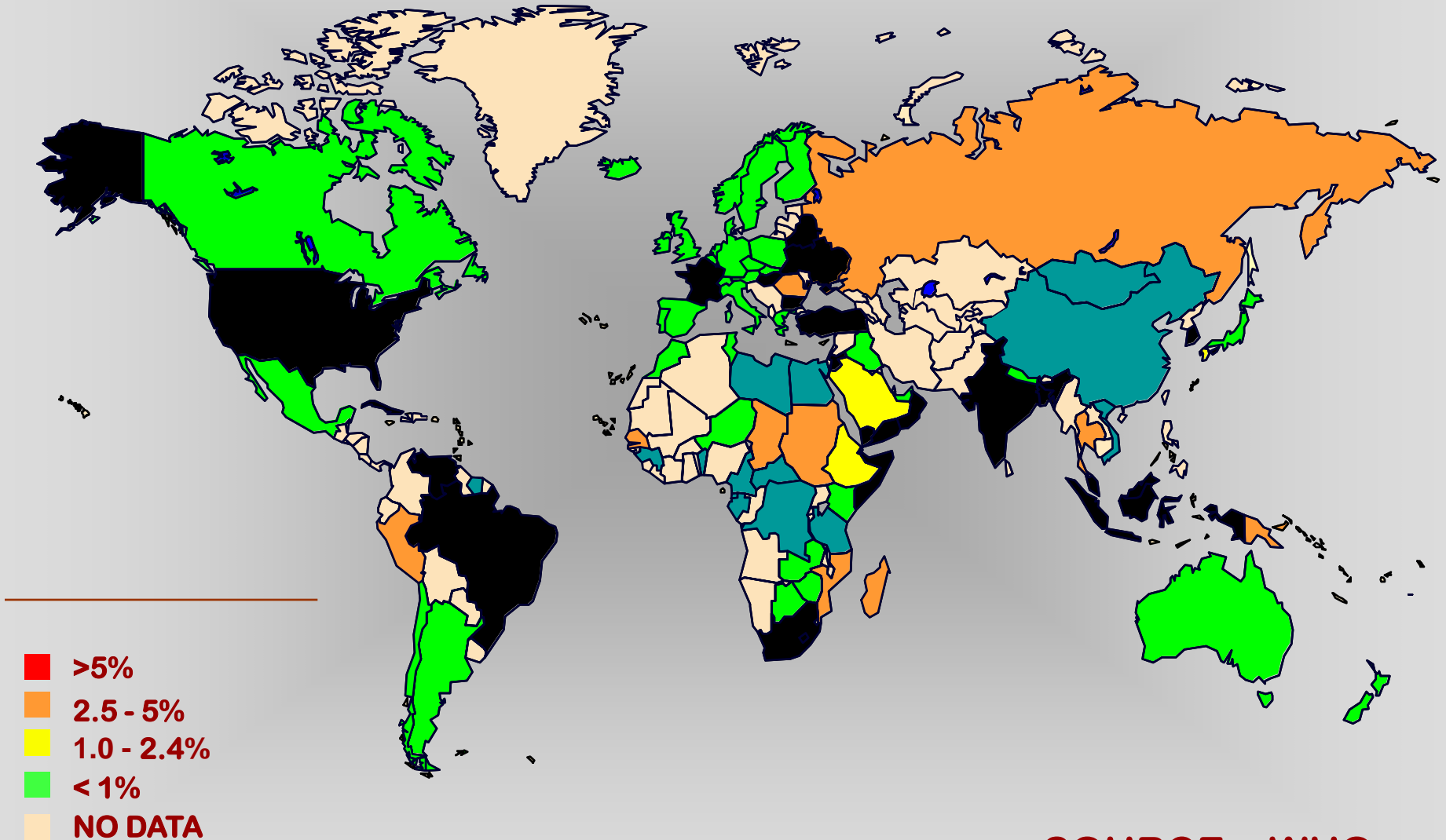
Blumberg et al.	“Australian antigen” Virus B	1965
Feinstone et al.	Virus A	1973
Rizzetto et al.	Virus D (delta agent)	1977
Balayn et al.	Virus E	1983
Houghton, Choo et al.	Virus C	1989
Simon et al.	GBV-C	1995
Zinnen et al.	Virus G	1996
Nishigawa et al.	Virus TT	1997

# DISTRIBUTION OF HBV

Figure 5 - % of population chronically infected with hepatitis B<sup>(19)</sup>



# DISTRIBUTION OF HCV



SOURCE: WHO

# IMPORTANCE OF VIRUS CHRONIC HEPATITIS INFECTIONS

- MEDICAL
- SOCIAL
- ECONOMICAL

# IMPORTANCE OF VIRUS CHRONIC HEPATITIS INFECTIONS

DISTRIBUTION	GLOBAL (NUMBER)	BULGARIA (%)
HBV	500 MLN.	8 %
HCV	150 MLN.	1,5 %

11 % OF HBV CARRIERS ARE INFECTED WITH HDV

# HEPATIC DISEASES IN DIALYSIS PATIENTS

- STEATOSIS – STEATOHEPATITIS
- DRUG INDUCED HEPATOTOXICITY
- OEDEMA HEPATIS DUE TO HEART FAILURE
- ACUTE VIRUS HEPATITIS (HAV, HBV, HCV)
- **CHRONIC VIRUS HEPATITIS (HBV, HCV)**
  - CIRRHOSIS HEPATIS
- HEPATOCELLULAR CARCINOMA

# GENERAL POPULATION

HEPATIC CIRRHOSIS - 20%

PRIMARY HEPATIC CARCINOMA - 4-5 %

# DIALYSIS PATIENTS

- HEPATIC CIRRHOSIS - 1,5 – 2 %
- HEPATOCELLULAR CARCINOMA -

**\*TIME NEEDED FOR THE DEVELOPMENT OF THESE  
COMPLICATIONS SURPASSES AVERAGE SURVIVAL OF DIALYSIS  
PATIENTS**

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**IMPROVEMENT OF DIALYSIS TREATMENT - ↑ SURVIVAL**



# DISTRIBUTION OF HBV AND HCV IN PATIENTS ON HD > PD

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## HD

- INVASIVE INTERVENTIONS (500 / ANNUALLY)
- HOSPITAL INFECTIONS (HANDS, GLOVES, MULTIDOSE VIALS)  
ESA - ↓ HAEMOTRANSFUSIONS

## PD

- NO EXTRACORPORAL CIRCUIT AND BLOOD MANIPULATIONS
- NO CONTACT WITH INFECTED PATIENTS
  - ↓ HAEMOTRANSFUSIONS

# DISTRIBUTION OF HBV AND HCV IN DIALYSIS PATIENTS - GLOBAL

COUNTRY	HBV (%)	HCV (%)
SAUDI ARABIA KINGDOM	-	68
SYRIA	-	49
TUNIS	53	42
TAIWAN	22	34
BRAZIL	12-45	11-26
JAPAN	2,1	27
USA	2,4	8,4

*DEPENDANCE ON SOCIO-ECONOMIC STATUS (ESA, VACCINATIONS)*

# DISTRIBUTION OF HBV AND HCV IN DIALYSIS PATIENTS - EUROPE

## “NORTH-SOUTH GRADIENT”

	HBV	HCV
NETHERLANDS	-	2,9 – 3,4 %
SWITZERLAND	1,5	5
GERMANY	4,6	7
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SPAIN	2,8	19 – 30
ITALY	4,3	47 – 60
BULGARIA	9,1	25,2

***HIGH RATE OF HBV AND SIMILAR RATE OF HCV***

# **BULGARIAN MULTICENTER OBSERVATIONAL STUDY ON HBV-HCV INFECTIONS IN DIALYSIS POPULATION 2004**

- **RATE OF HBV-HCV (POS)PATIENTS AND PERSONAL**
  - **NUMBER OF VACCINATED FOR HBV – WHEN?**
  - **NUMBER OF PATIENTS WITH HEPATIC LESION?**
- **NUMBER OF POSITIVE PATIENTS BEFORE ONSET OF  
DIALYSIS TREATMENT**

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***58 DIALYSIS STRUCTURES – 2252 PATIENTS***

# RESULTS

## RATE OF DISTRIBUTION AMONG DIALYSIS PATIENTS

	HBV (POS)		HCV (POS)	
	NUMBER	%	NUMBER	%
SERO (POS) DIAL. POP. <i>GENERAL POPULATION</i>	205	9,1 8	568	25,2 1,5
VACCINATED - TOTAL	588	26,1	-	-
VACCINATED - BEFORE ONSET	32	1,4	-	-
MANIFESTED HEPATITIS LABOR./CLINICALLY	60	2,6	62	2,7

# RESULTS

## RATE OF DISTRIBUTION AMONG DIALYSIS PERSONAL

	HBsAg (POS)	HCV (POS)
DOCTORS	9	4
NURSES	8	7
HOSP. ATTENDANTS	10	1
TECHNICIANS	7	-
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TOTAL NUMBER - 46:	34	12
INFECTED PRIOR TO WORK IN HD CENTER MANIFESTED HEPATITIS		3 5

# CONCLUSIONS:

- DIALYSIS PATIENTS AND PERSONAL CONSTITUTE HIGH RISK GROUPS.  
(PREVALENCE OF HBV AND ESPECIALLY HCV IS HIGHER COMPARED TO NORMAL POPULATION)
  - VACCINATED - 26%  
(MEDICAL STANDARD – 100%)
  - VACCINATED BEFORE ONSET OF HD – 1,4%  
(INADEQUITE CONNECTION GP - NEPHROLOGIST)
- CONTROL OF HBV-HCV CARRIERS IRREGULARLY DONE, (SELDOM BEFORE ONSET OF DIALYSIS TREATMENT)

# CONCLUSIONS:

- THE RATE OF HCV(POS) DIALYSIS PATIENTS - (25,2%) IS SIMILAR TO OTHER SOUTHERN EUROPEAN COUNTRIES, BUT **SIGNIFICANTLY EXCEEDS** THE RATE OF INFECTED IN GENERAL POPULATION (1,5%)
- THE RATE OF HBV (9,1%) **IS HIGH**, PROBABLY AS A RESULT OF THE FACT, THAT THIS IS A WIDE SPREAD INFECTION IN THE GENERAL POPULATION (8%)
- IF THE STUDY IS REPEATED AFTER THE IMPLEMENTATION OF THE DIALYSIS STANDARD IN THE PRACTICE, THERE IS A POSSIBILITY THE RESULTS **TO BE WORSE**



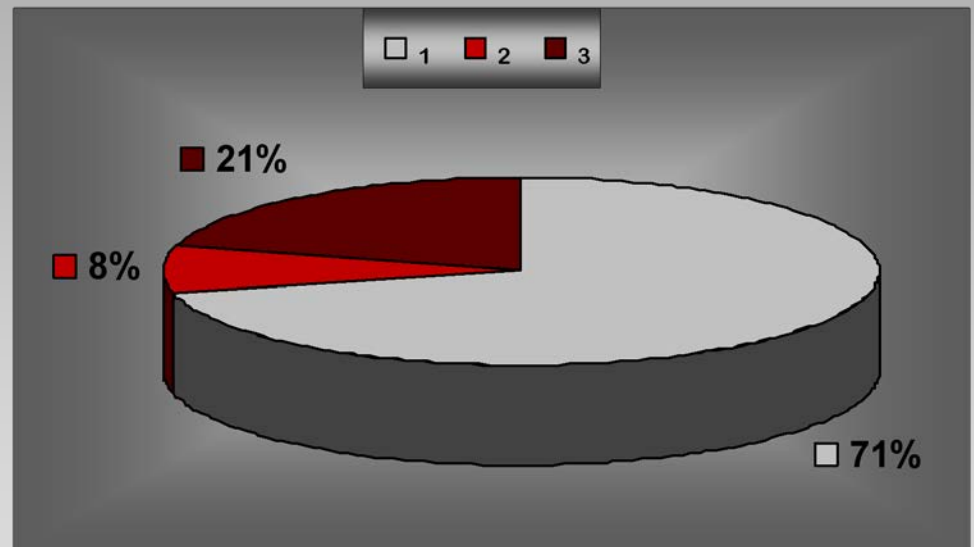
# 'ALEKSANDROVSKA' HOSPITAL

2006

TOTAL NUMBER  
TESTED – 69

HBsAg – 8 pos

HCV – 20 pos



# 'ALEKSANDROVSKA HOSPITAL'

<b>YEAR</b>	<b>TOTAL NUMBER</b>	<b>HBsAg POS</b>	<b>HCV POS</b>
<b>2007</b>	<b>75</b>	<b>9</b>	<b>16</b>
<b>2008</b>	<b>73</b>	<b>7</b>	<b>17</b>
<b>2009</b>	<b>75</b>	<b>6</b>	<b>14</b>
<b>2010</b>	<b>78</b>	<b>8</b>	<b>12</b>

# BULGARIA 2009

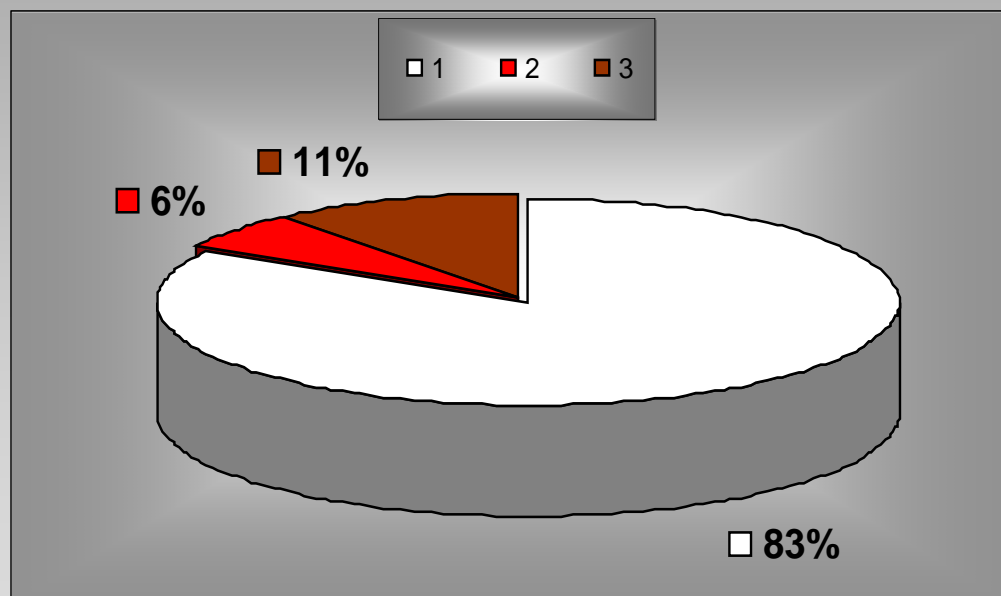
2009

TOTAL NUMBER  
TESTED – 2850 HD

151 PD - ?

HBsAg – 193 POS

HCV – 372 POS



# UNIVERSAL PRECAUTIONS

- **BARRIER PROTECTION : GLOVES, GLASSES, MASKS, OVERALS**
- **VIGOROUS WASHING OF HANDS AND SKIN AFTER CONTACT WITH BLOOD AND BODY LOQUIDS**
  - **PRECAUTIONS AGAINST PUNCTURES**
  - **DISPOSAL OF PIERCING AND CUTTING CONSUMATIVES IN SPECIAL SAFE CONTAINERS**

# **SPECIFIC DIALYSIS PRECAUTIONS**

- **HCV AND HBV CARRIERS MUST BE DIALYZED ON SEPARATE MACHINES AND IN SEPARATE ROOMS**
- **ADHERENCE TO THE UNIVERSAL RULES, DESINFECTION OF DIALYSIS EQUIPMENT, SURGICAL INSTRUMENTS AND DIALYSIS CENTER PREMISES**
- **PROMOTION OF HYGIENE RULES AMONG DIALYSIS PATIENTS AND EPIDEMIOLOGICAL CULTURE**

# SEROLOGY MARKERS FOR INFECTION

**HBV - HBsAg / ELISA**

**HCV - ANTI-HCV AB / ELISA - III AND IV GEN.**

**\*FALSE SERO POSITIVENESS - /B-CELL STIMULATION DUE TO OTHER INFECTIONS AND AUTOIMUNE DISEASES**

**\* FALSE SERO NEGATIVE RESULTS - 9 %**

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**ALL HEMODIALYSIS PATIENTS SHOULD HAVE AT LEAST ONE HCV RNA – PCR TEST, REGARDLESS OF THEIR SEROLOGICAL STATUS**

# VIRUS REPLICATION MARKERS

## HBV INFECTION

HBV-DNA POLYMERASE CHAIN REACTION (PCR)

## HCV INFECTION

HBV-RNA POLYMERASE CHAIN REACTION (PCR)

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QUANTITATIVE METHODS = ACTIVITY

(NEED OF TREATMENT!)

# **MEDICAL STANDARD**

## **‘DIALYSIS TREATMENT’**

**PERIODICAL TESTING OF PATIENTS WITH MARKERS  
DETECTING**

- HBV, HCV CARRIERS – EVERY 6 MONTHS**

- HIV CARRIERS – EVERY 12 MONTHS**

**/ HBsAg, HCV Ab, HIV Ab WITH ELISA, RIBA, PCR/**

**VACCINATION AND REVACCINATION OF PATIENTS AND  
PERSONAL AGAINST HBV**



# CONCLUSIONS:

**THE RATE OF HBV INFECTION IN DIALYSIS PATIENTS IS UNCHANGED RECENTLY AND IS HIGH DUE TO SIMILAR PREVALENCE IN GENERAL POPULATION**

**THE RATE OF HCV INFECTION TENDS TO BE LOWER  
OWING TO:**

- WIDER APPLICATION OF ESA INSTEAD OF HAEMOTRANSFUSIONS
- RIGOROUS TESTING FOR HEPATITIS VIRUSES OF TRANSFUSED BLOOD
  - PERIODICAL TESTING OF DIALYSIS POPULATION
  - SOPHISTICATED DIALYSIS EQUIPMENT