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Why are we still isolating  
Hepatitis B patients?  
Are guidelines based on  
evidence or tradition?

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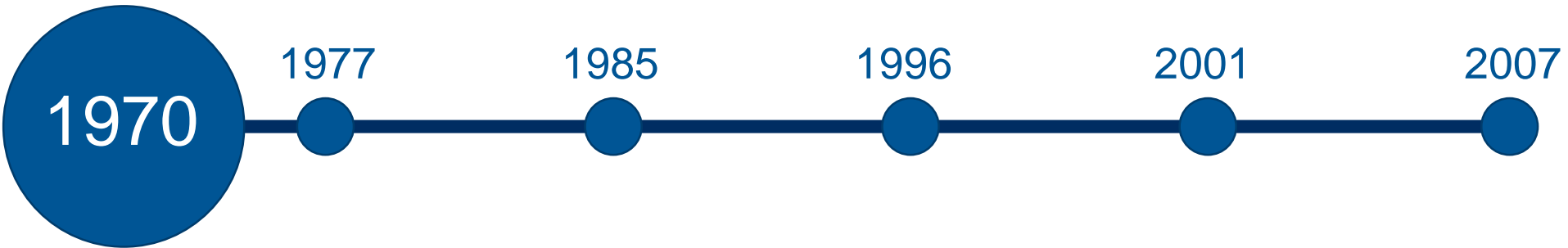
## What we know

- Standard Precautions are the foundation for Infection Prevention & Control
- Standard Precautions are applied to all patients
- Standard Precautions means all patients are treated equally regardless of their known blood borne virus status
- Patients in haemodialysis with Hepatitis B are not treated equally, they are isolated or segregated away from other patients.

# Presentation overview

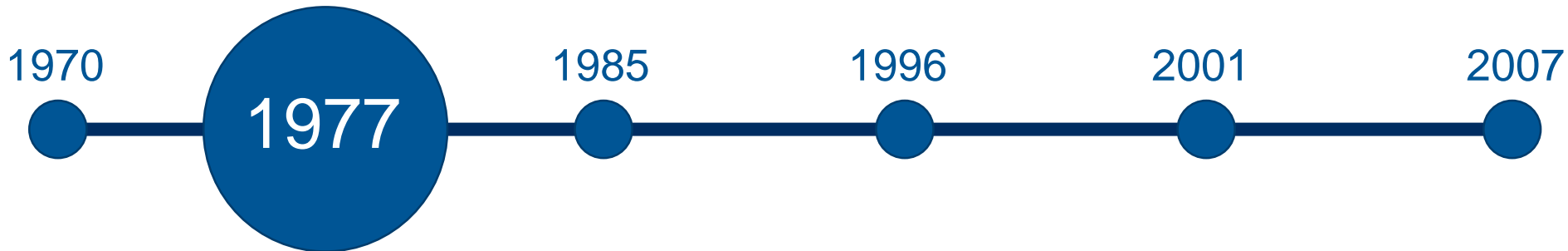
- Origins of standard precautions and haemodialysis precautions
- Why haemodialysis is considered a higher risk of Hepatitis B transmission than other areas of healthcare
- Review of infection control bundles
- Current Australian guidelines for management of Hepatitis B patients in haemodialysis
- Impact of isolation on haemodialysis patients
- How standard precautions can address the Hepatitis B transmission risks in haemodialysis

## Timeline



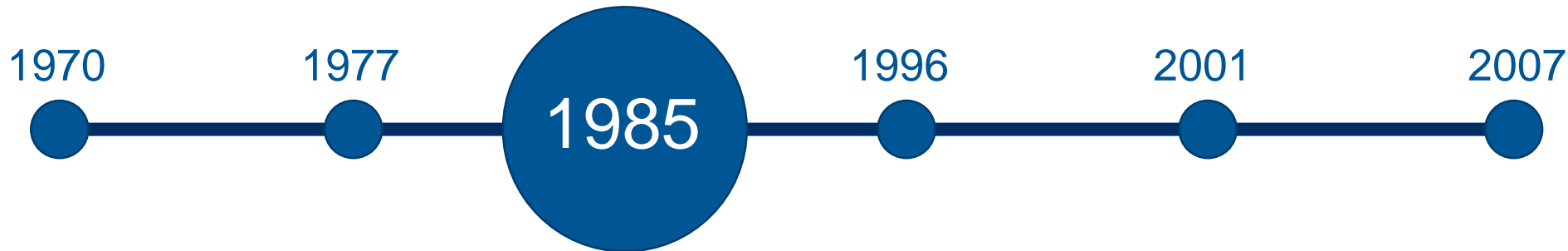
Year	Guideline	Comment
1970	Isolation techniques for use in hospitals <sup>1</sup>	<ul style="list-style-type: none"><li>Introduced seven isolation precaution categories including one for blood.</li></ul>

## Timeline



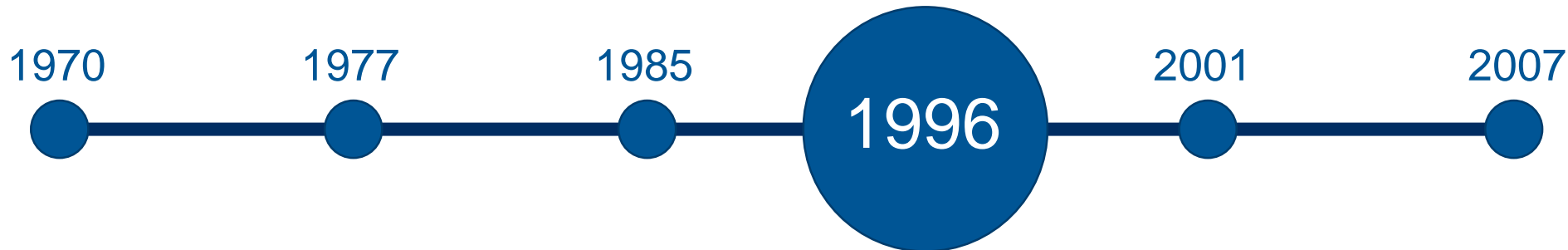
Year	Guideline	Comment
1977	HBV control in Haemodialysis <sup>2</sup>	<ul style="list-style-type: none"><li>Bundled IPC practices including: isolation of HBV patients and cleaning shared patient equipment</li></ul>

## Timeline



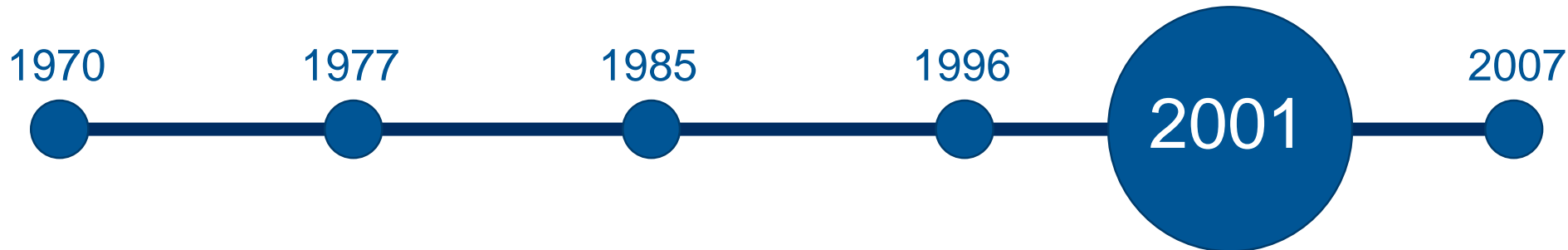
Year	Guideline	Comment
1985	Universal Precautions <sup>3</sup>	<ul style="list-style-type: none"><li>• Developed to prevent transmission of HIV from patients to HCW</li><li>• Treat all patients as potentially infected with a BBV</li><li>• Did not cease isolation of patients with known BBV</li></ul>

# Timeline



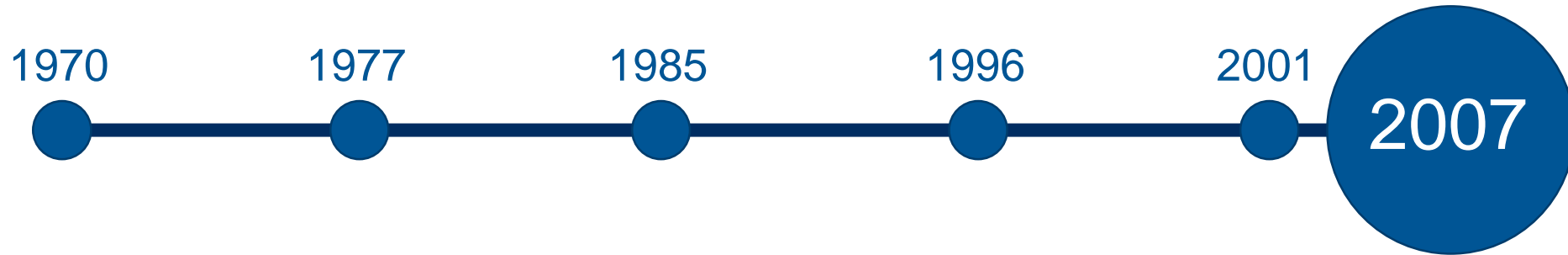
Year	Guideline	Comment
1996	Standard Precautions (Guideline for Isolation Precautions in Hospitals) <sup>4</sup>	<ul style="list-style-type: none"><li>• Expanded on universal precautions</li><li>• Prevention of transmission of BBV from patients to HCW</li><li>• Prevention of transmission of BBV and other infections between patients</li><li>• Isolation for BBV no longer required</li></ul>

## Timeline
















Year	Guideline	Comment
2001	Prevention of transmission of infections in Haemodialysis <sup>5</sup>	<ul style="list-style-type: none"><li>• Bundled IPC practices including isolation of HBV patients</li><li>• Recommendations for prevention of other infections between haemodialysis patients</li></ul>

## Timeline




Year	Guideline	Comment
2007	Guideline for Isolation Precautions <sup>6</sup>	<ul style="list-style-type: none"><li>• Detailed guideline on management of infectious agents requiring isolation</li><li>• No mention of isolation for blood borne viruses or in haemodialysis</li></ul>

# Standard Precautions

Action	Universal Precaution	Protects HCW	Protects patients
Hand Hygiene	UP		
Personal Protective Equipment	UP		
Sharps safe handling and disposal	UP		
Environmental cleaning			
Cleaning and reprocessing medical equipment			
Respiratory Hygiene			
Aseptic Technique			
Waste Management			
Appropriate handling of linen			

# Haemodialysis considered high risk for transmission of Hepatitis B

- **Patient to patient transmission of hepatitis B virus: a systematic review of reports on outbreaks between 1992 and 2007.** Published 2009. <sup>7</sup>
- Results of the systematic review was that dialysis units accounted for the highest number of reported outbreaks.
- Unfortunately this has been misinterpreted as HBV outbreaks occurring most frequently in haemodialysis.
- The authors recognise that increased surveillance in dialysis could explain the higher frequency of reporting in dialysis units and that the outbreaks were mostly due to deficiencies in infection control practices.

**BMC Medicine**

Research article

**Patient to patient transmission of hepatitis B virus: a systematic review of reports on outbreaks between 1992 and 2007**

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**Abstract**

**Background:** Hepatitis B outbreaks in healthcare settings are still a serious public health concern in high-income countries. To elucidate the most frequent infection pathways and clinical settings involved, we performed a systematic review of hepatitis B virus outbreaks published between 1992 and 2007 within the EU and USA.

**Methods:** The research was performed using two different databases: the PubMed Database and the Outbreak Database, the worldwide database for nosocomial outbreaks. Selection of papers was carried out using the Quorum algorithm, and to avoid selection biases, the inclusion criteria were established before the articles were identified.

**Results:** Overall, 30 papers were analyzed, reporting on 33 hepatitis B virus outbreaks that involved 471 patients, with 16 fatal cases. Dialysis units accounted for 30.3% of outbreaks followed by medical wards (21.2%), nursing homes (21.2%), surgery wards (15.2%), and outpatient clinics (12.1%). The transmission pathways were: multi-vial drugs (30.3%), non-disposable multi-patient capillary blood sampling devices (27.2%), transvenous endomyocardial biopsy procedures (9.1%), and multiple deficiencies in applying standard precautions (9.1%).

**Conclusion:** The analysis of transmission pathways showed that some breaches in infection control measures, such as administration of drugs using multi-vial compounds and capillary blood sampling, are the most frequent routes for patient-to-patient transmission of hepatitis B virus. Moreover some outbreak reports underlined that heart-transplant recipients are at risk of contracting hepatitis B virus infection during the transvenous endomyocardial biopsy procedure through indirect contact with infected blood as a result of environmental contamination. To prevent transmission, healthcare workers must adhere to standard precautions and follow fundamental infection control principles, such as the use of sterile, single-use, disposable needles and avoiding the use of multi-vial compounds in all healthcare settings including outpatient settings.

## Past history

Topic	Past history	Current practices
Reuse	Dialysers were reused multiple time, risk used for incorrect patients	Dialyser reuse ceased mid 1990's in Australia
Single pass dialysis machines	Some machines recirculated water	Fluid pathway single pass of the dialyser and then down the drain so not infecting clean fluid pathways
Blood transfusions	Patients required frequent blood transfusions for low haemoglobin	Early 1990's introduction of EPO, reduced no of blood transfusions
Blood transfusion screening for HBV	Transmission of HBV through blood transfusions	Blood product HBV screening commenced 1971, no longer blood transfusion acquisition
Blood transfusion screening for HCV	HCV commonly transmitted via blood transfusions	Blood product HCV screening commenced 1992, no longer blood transfusion acquisition

# Transmission of Hepatitis B virus in Dialysis Units

Fabrizio et al systematic review published 2015 <sup>8</sup>

## Reasons for transmission

Multiple deficiencies in standard precautions

Deficient hand hygiene

Multi-use medication vials

Shared supplies

Blood products

IJA  
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REVIEW

## Transmission of hepatitis B virus in dialysis units: a systematic review of reports on outbreaks

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### ABSTRACT

**Background:** Changes in the delivery of healthcare in the developed world have resulted in frequent reporting of outbreaks of hepatitis B virus (HBV) infection in nonhospital healthcare settings, including hemodialysis units.

**Aim:** We performed a systematic review of HBV outbreaks in dialysis units of developed and less-developed countries published between 1992 and 2014 to elucidate the most frequent mechanisms of patient-to-patient transmission of HBV in this setting.

**Methods:** The research was performed using the PubMed Database and the Outbreak Database; studies were selected according to the PRISMA algorithm. Inclusion criteria were established before the papers were retrieved in order to avoid selection biases.

**Results:** 12 papers reported on 16 outbreaks that involved 118 patients on maintenance dialysis; 10 fatal cases occurred. European outbreaks were smaller compared with the others ( $P = 0.0046$ ). Information on specific transmission pathways was given in many outbreaks ( $n = 10$ ; 62%); multiple deficiencies in standard or hemodialysis-specific procedures was the most common route of patient-to-patient transmission of HBV (80%, 8/10). De novo HBV from HBsAg negative/HBV DNA positive blood donors was found in 2 (20%) outbreaks. Sharing of contaminated HD machines was mentioned in 1 report.

**Conclusions:** Our systematic review of HBV outbreaks shows that incomplete adherence to standard and dialysis-specific infection control precautions was the most important cause of patient-to-patient transmission of HBV in dialysis units. This review should serve as a reminder to HD providers that the risk of HBV infection is still present among patients undergoing dialysis and that HBV may be easily transmitted in the dialysis setting whenever appropriate infection control practices are not strictly applied.

**Keywords:** Hepatitis B virus, Hemodialysis, Outbreak, Transmission

### Introduction

Hepatitis B virus (HBV) infection remains an important agent of liver disease among patients with end-stage renal disease and plays a detrimental role on survival in patients on maintenance dialysis and after renal transplant (1). Patients undergoing maintenance hemodialysis are at risk for blood-borne infections (including HBV) due to several reasons: hemodialysis requires vascular access for prolonged periods, and the immune system compromise caused by chronic uremia increases

their susceptibility to infections. Also, hemodialysis units are an environment where multiple patients receive treatment concurrently, so that repeated opportunities exist for person-to-person transmission.

To prevent transmission of blood-borne pathogens (including HBV) in hemodialysis units, universal precautions and hemodialysis-specific, infection-control procedures were recommended in 1977 by the Centers for Disease Control and Prevention (CDC) (2). By 1980, their widespread implementation was associated with a sharp reduction in incidence of HBV infection among both patients and staff members. According to the most recent surveys, the rate of patients on maintenance dialysis who are chronic HBsAg carriers range between 1% and 15% (3, 4); HBsAg seropositive status is less frequent in high-income countries.

The delivery of healthcare in the developed world has changed over recent years, leading to an increased number of patients treated outside of acute care hospitals. Thus, numerous outbreaks of HBV infection in nonhospital healthcare settings, including dialysis units, have been reported (5-6). In healthcare settings such as dialysis units, HBV may

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## HBV outbreak – reason and solution

Reason	Solution	Included in Standard precautions
Deficiencies in standard precautions	Audit and education	Yes
Non-compliant hand hygiene	Audit and education	Yes
Multi-use medication vials	Single use medication vials	Yes
Shared supplies	Consumables dedicated to single patient use	General IPC practice
Blood products	Blood and blood products screened for BBV's during collection	Yes

## Bundled IPC practices

- Resar et al, described a care bundle as “A small set of evidence-based interventions for a defined segment / patient population and care setting..” p 2 <sup>9</sup>
- “Aim of bundles is to reduce harm and improve care for the patient...” p8 <sup>9</sup>

Isolation of HBV patients in haemodialysis clinics has been part of the haemodialysis care bundle, along with many aspects of standard precautions. These bundles have successfully reduced transmission of HBV in HD clinics. <sup>2, 10, 11</sup>

It has then been assumed that isolation is required to prevent transmission of HBV in HD.

Even though “The evidence for isolating patients with HBV infections is sparse.” p20 <sup>12</sup>(KHA/CARI)

**Isolation of HBV patients in HD clinics is not individually evidence based and is harmful to patients.**

## INFECTION CONTROL FOR HAEMODIALYSIS UNITS

### 4. Management of patients with positive results for blood-borne virus in the dialysis unit

- b) We suggest that HBsAg positive patients be dialysed in isolation or cohorted in an area that is separate to that where patients who are HBsAg negative receive dialysis (2C).

#### Level 2C evidence

C = Low quality of evidence – The true effect may be substantially different from the estimate of the effect

Level 2 “We suggest”

Patients	Policy
The majority of people in your situation would want the recommended course of action, but many would not	The recommendation is likely to require debate and involvement of stakeholders before policy can be determined

# Australian Guidelines 2018



KIDNEY  
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## INFECTION CONTROL FOR HAEMODIALYSIS UNITS

### 4. Management of patients with positive results for blood-borne virus in the dialysis unit

- b) We suggest that HBsAg positive patients be dialysed in isolation or cohorted in an area that is separate to that where patients who are HBsAg negative receive dialysis (2C).

Studies used to support isolation of HBV patients were by Yuan et al <sup>10</sup> and Burdick et al <sup>11</sup>.

These studies showed that a bundle of IPC practices including auditing, staff education and isolation resulted in decreased transmission of HBV in haemodialysis.

“The evidence for isolating patients with HBV infections is sparse.” p20 <sup>12</sup>(KHA/CARI)

# Isolation – impact on patient with HBV

## Specific to dialysis

- Breaches in confidentiality
  - All patients in a clinic assume that a patient treated in the HBV room must have HBV.
- Discrimination by other patients
  - Patients treated specially in a separate room then share waiting room and transport with other patients
- Reduced opportunities when travelling
  - Some clinics do not accept patients with HBV
  - Some clinics do not accept any patients from a clinic which doesn't isolate HBV patients

# Isolation – impact on other patients in the clinic

- Isolation room used for HBV patients so not available for patients who require transmission based precautions
  - Multi-resistant organisms – contact precautions e.g. CPE
  - Respiratory illnesses – droplet precautions e.g. InfluenzaIncreasing the risk of transmission of other illnesses to other patients
- Increasing number of patients with early stages of dementia who benefit from a single room
  - Calmer environment
  - More room for carers to assist the patient
  - Less disruptive to other patients

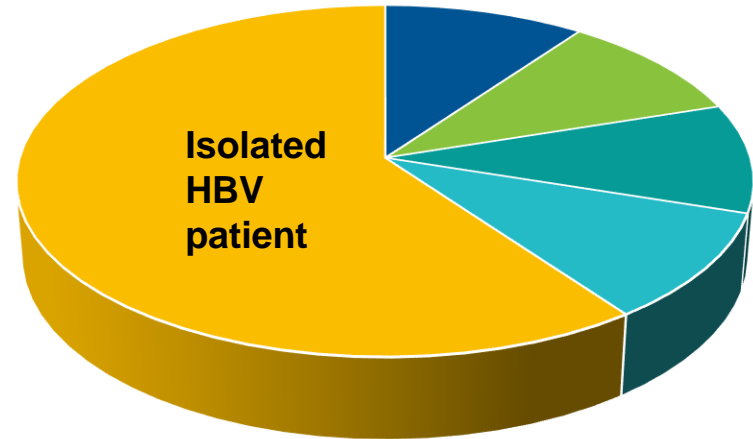
# Isolation – Impact on resources

## Staffing

- Nurses treating HBV +ve patients not able to care for HBV -ve patients

## Financial

- Extra cost building isolation rooms for HBV patients use only.



# AMA Position Statement – Blood Borne Viruses



## AMA Position Statement

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### Blood Borne Viruses (BBVs) 2017

#### 2. Guiding Principles

The prevention, treatment, and management of BBVs should be informed by the following guiding principles:

- **Removal of discrimination and stigma associated with BBVs** (including the right to participate in the community without experiencing stigma and discrimination), and the same rights to comprehensive and appropriate health care as other members of the community, including the right to confidential and sensitive handling of personal and medical information.

# Guidelines

Are guidelines  
based on tradition

OR

Evidence based  
practices?

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# Thank you

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