

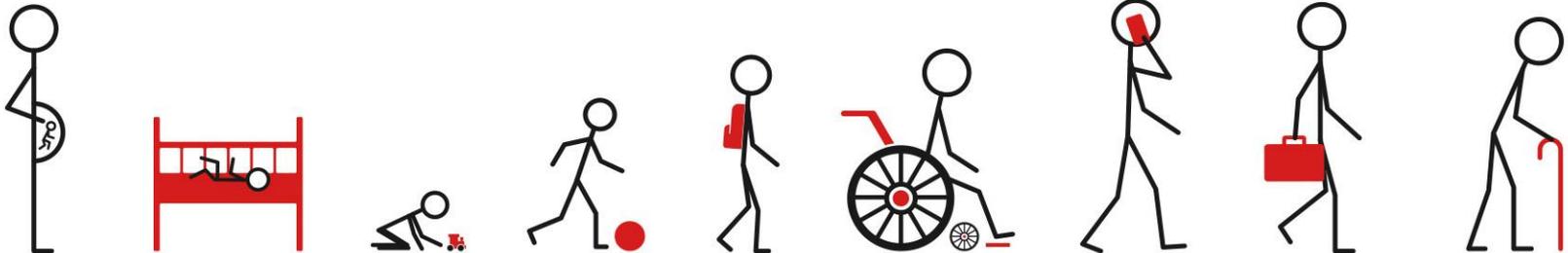


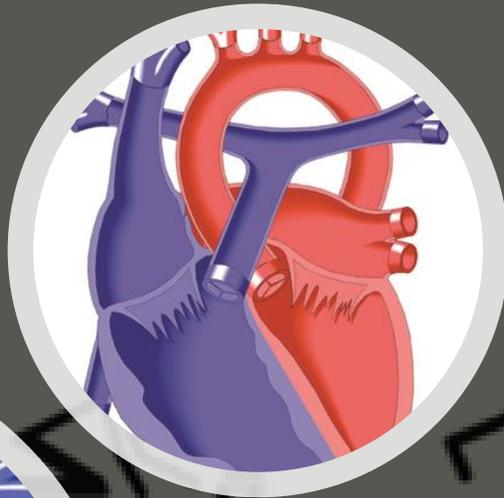
# Congenital

**HEART NETWORK**

NORTH WEST | NORTH WALES | ISLE OF MAN

**Infective Endocarditis  
Cardiac Link Nurse Study Day  
15/09/2021**





# Aim of Talk

---

What is endocarditis?

---

What Symptoms

---

What causes it?

---

How do we diagnose it?

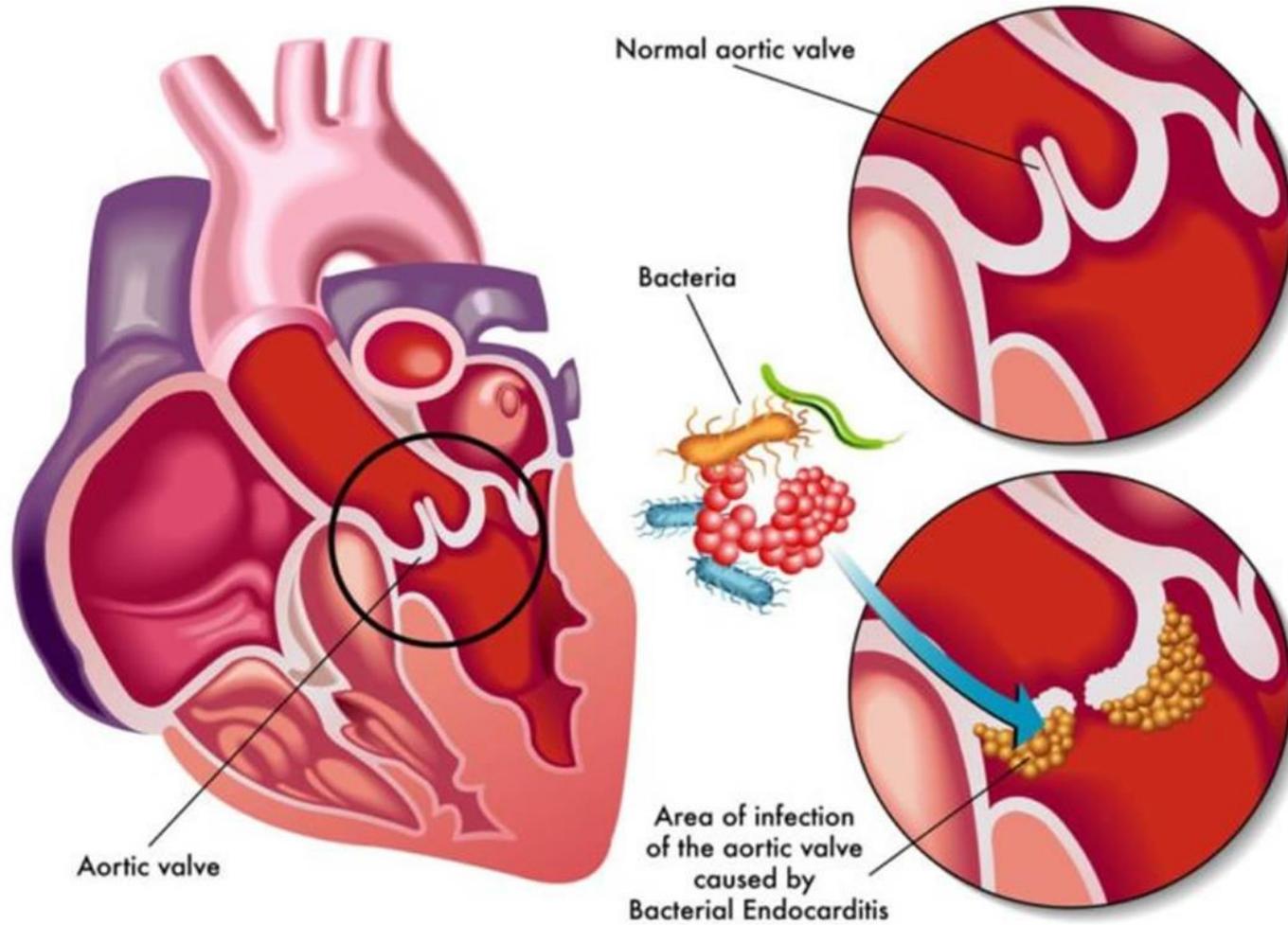
---

How do we treat it?

---

How can we prevent it?

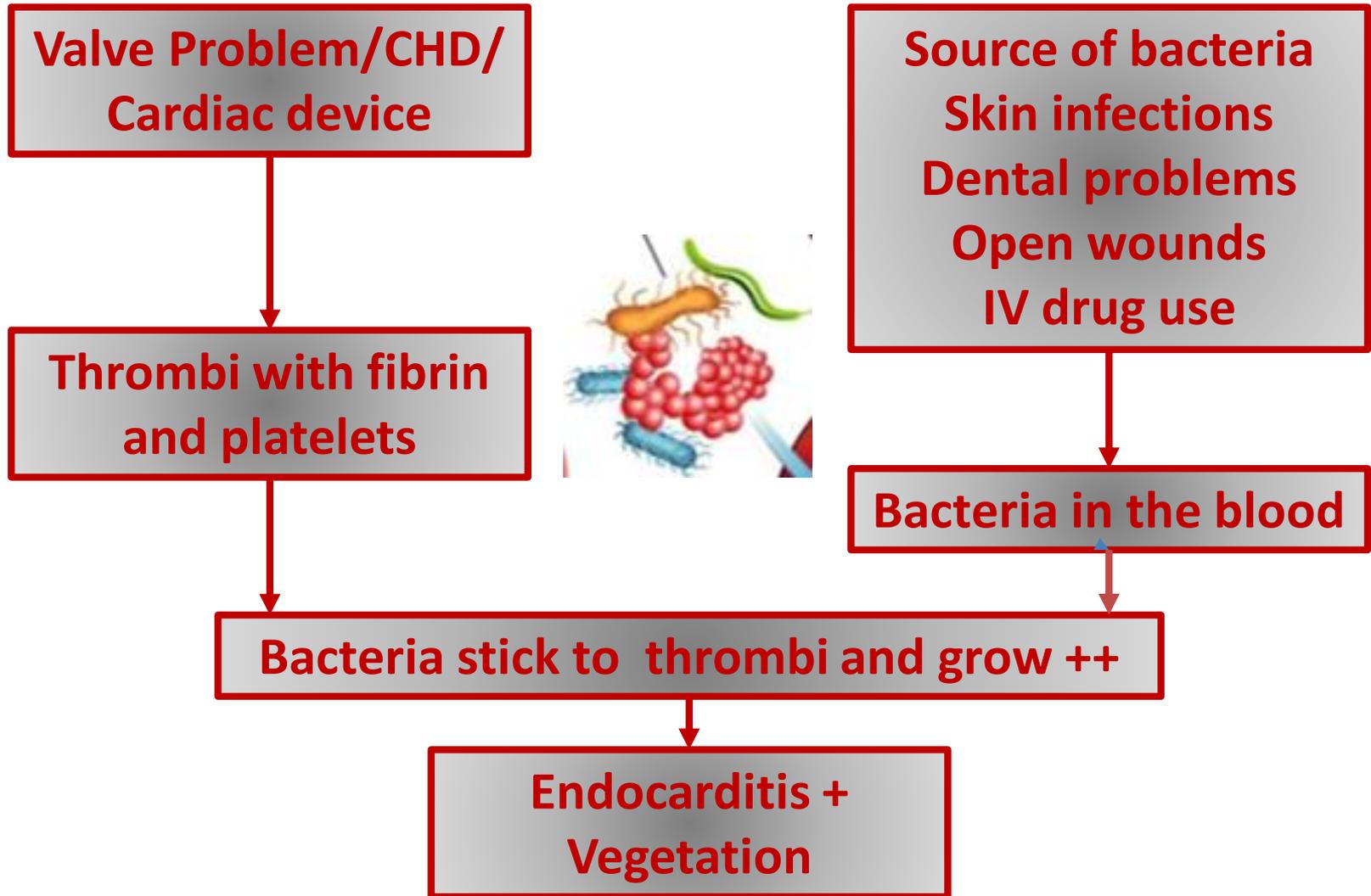
# What is Endocarditis?



<https://healthjade.com/endocarditis/>



# What Happens?



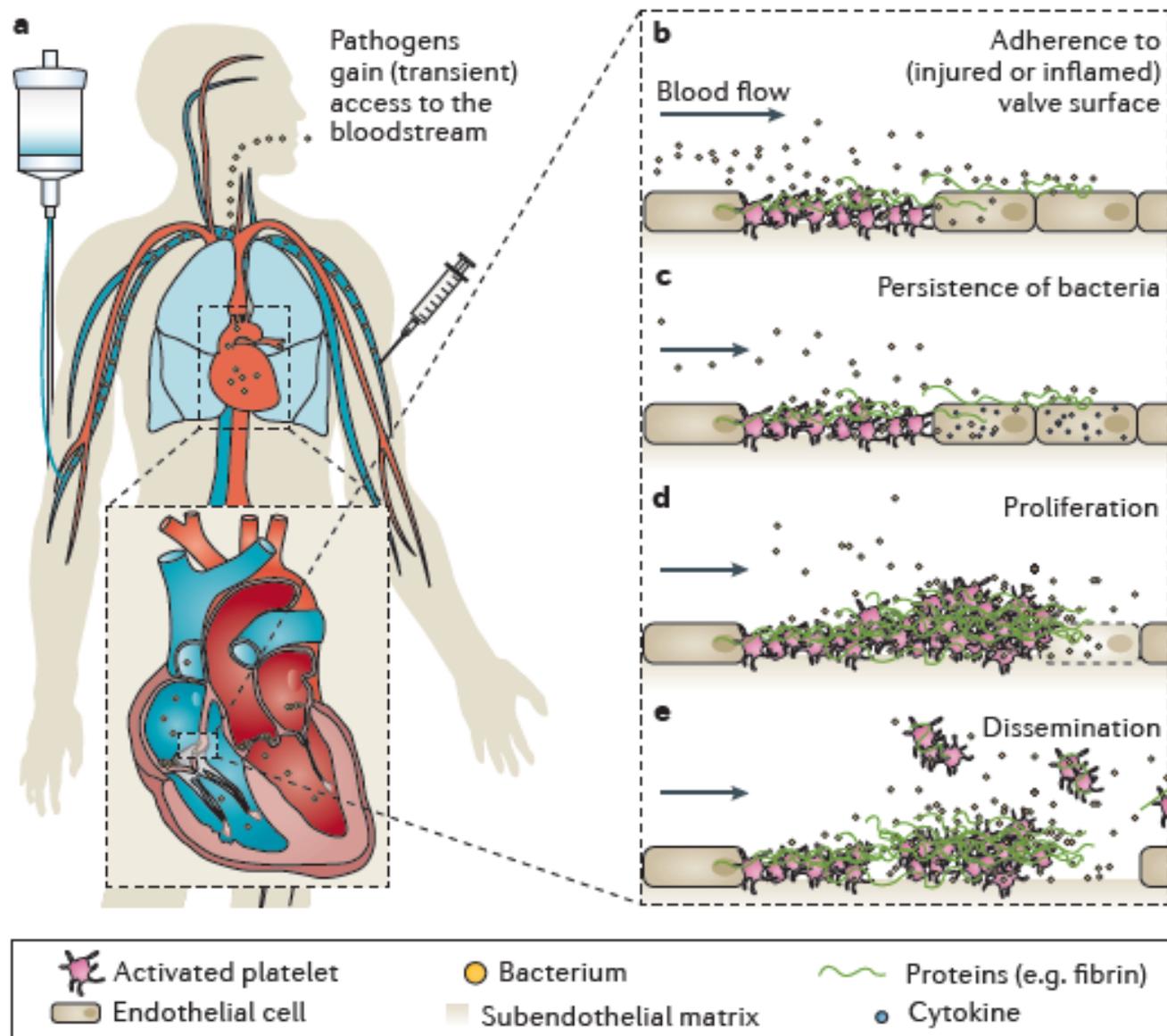


Figure adapted from REF. 204, Nature Publishing Group.

<https://www.nature.com/articles/nrdp201659.pdf>



# Who is at Increased Risk?

Children with congenital heart disease

A leaking or narrowed heart valve

A prosthetic (metal) heart valve

Other prosthetic material (conduits)

Hypertrophic Cardiomyopathy

Poor dental hygiene

Previous history of endocarditis

Skin infections

IV drug use

Other....



# Infective Endocarditis in Children With Congenital Heart Disease

Cumulative Incidence and Predictors

Editorial see p 1396

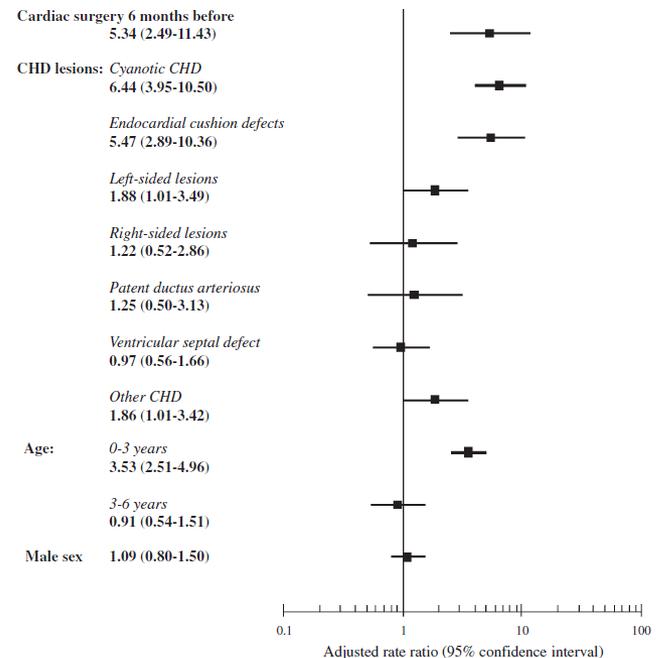
Dinela Rushani, MSc, Jay S. Kaufman, PhD, Raluca Ionescu-Ittu, PhD, Andrew S. Mackie, MD, SM, Louise Pilote, MD, MPH, PhD, Judith Therrien, MD, and Ariane J. Marelli, MD, MPH

## Study 1988 – 2010 (47,518 patients)

### Incidence of IE

- Cyanotic CHD lesions, left sided lesions and endocardial cushion defects (pASD and AVSD) were associated with increased risk
- Risk substantially elevated during 6 month after cardiac surgery
- Increased in children < 3 years

<https://www.ahajournals.org/toc/circ/128/13>



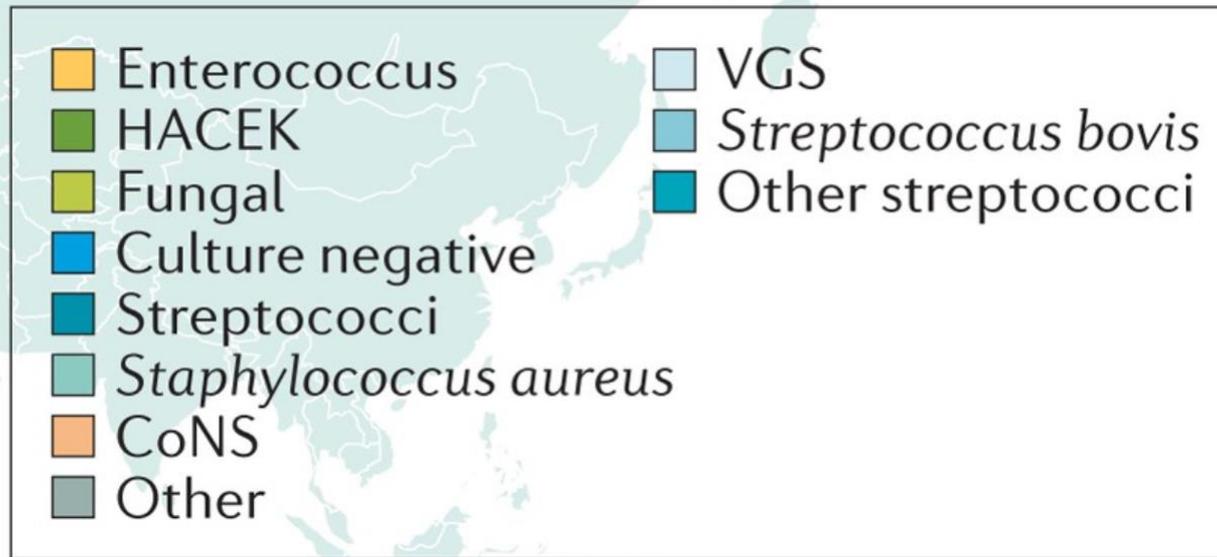
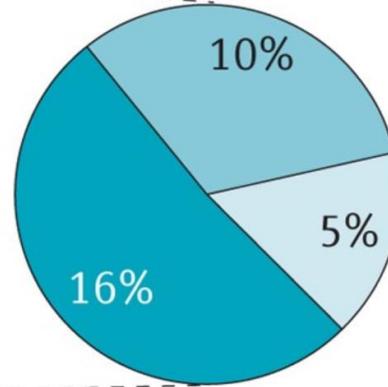
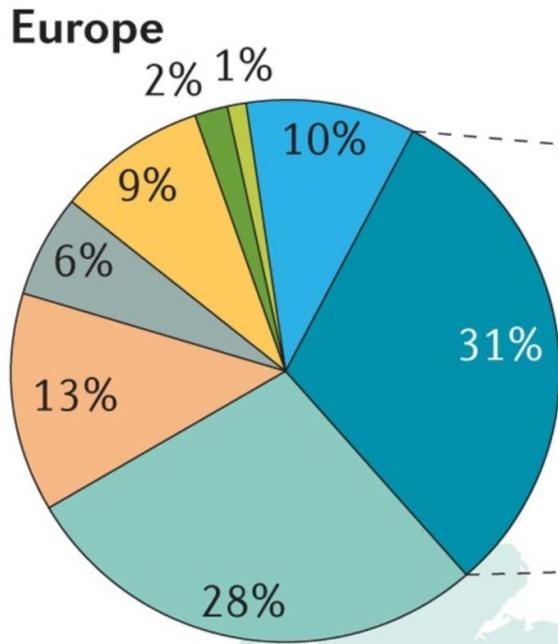


Figure 1 | **Global epidemiology of causative pathogens involved in IE.** The causative agents of infective endocarditis (IE) differ geographically. Data from Murdoch *et al.* CoNS, coagulase-negative staphylococci; HACEK, *Haemophilus* spp., *Aggregatibacter* spp., *Cardiobacterium hominis*, *Eikenella corrodens* and *Kingella* spp.; VGS, viridans group streptococci.

# How Does Bacteria Reach The Heart?

- **Mouth**

The risk is increased if teeth and gums are in a bad condition

- **Infection**

Bacteria can spread from the site of a pre-existing infection

- **Needles and tubes**

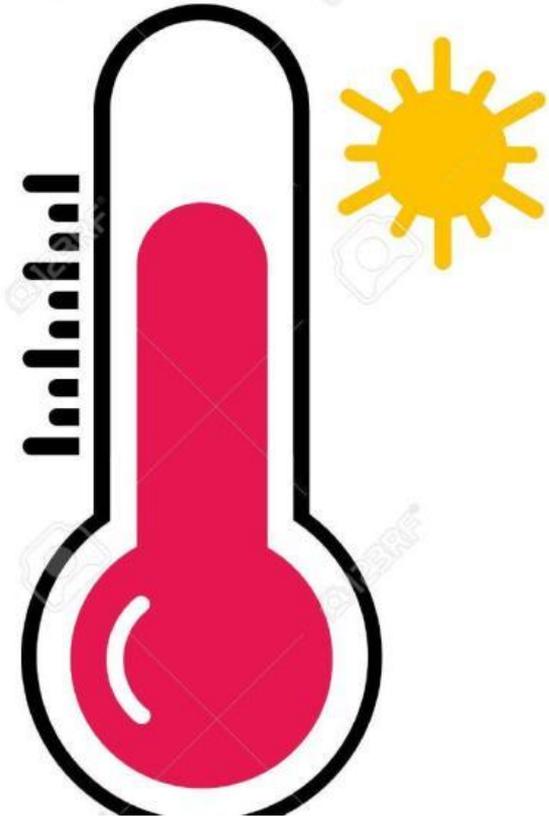
Any medical procedure that involves placing a medical instrument inside the body carries a small associated risk of introducing bacteria into the bloodstream.

IV drug use



# Symptoms

- a high temperature
- chills
- night sweats
- headaches
- shortness of breath
- cough
- tiredness (fatigue)
- muscle and joint pain
- Loss of weight
- Confusion



# Other Signs



small red or purple spots on the skin (**petechiae**)

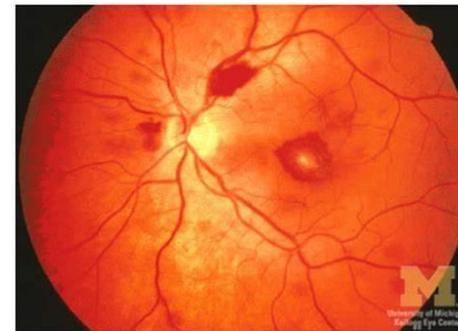


Source: Maxine A. Papadakis, Stephen J. McPhee, Michael W. Rabow: Current Medical Diagnosis & Treatment 2018 Copyright © McGraw-Hill Education. All rights reserved.

painless red spots on the palms and soles (**Janeway lesions**)



painful red lumps in the pads of the fingers and toes (**Osler's nodes**)



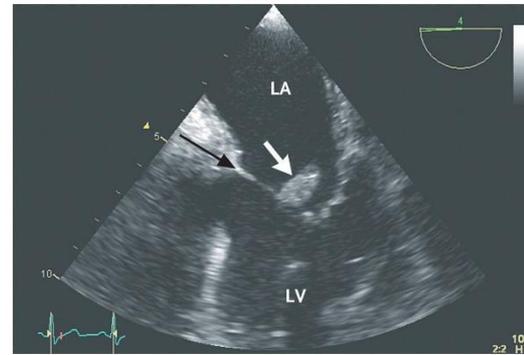
(Roth's spot in endocarditis)

Retinal hemorrhages (**Roth spots**)



# How do we Diagnose it?

- Can be difficult
- Simple blood tests to check for infection (FBC/CRP/ESR) before starting ABx
- If infection markers elevated – blood cultures
- ECHO/TOE
- ECG
- Chest X-Ray
- CT scan
- FDG-PET (nuclear medicine + radio labelled WCC scans)



# Treatment

Medical	Surgical
Intravenous Antibiotics 4-6 weeks	Intravenous Antibiotics
Finish course at home if OPAT service available	Surgery to remove vegetation and repair or replace valve
Higher risk of contracting endocarditis again	A mechanical valve=lifelong warfarin Huge implications

## Complications

- Heart failure
- Valve damage
- Micro embolic damage
  - Stroke
  - Peripheral ischaemia
  - Loss of limb
  - Organ failure
- Death



# NICE Guidance [CG64]

Published: 17 March 2008 Last updated: 08 July 2016

- NICE recommends:
- that people should not usually be given antibiotics before a procedure unless antibiotics are needed to treat a suspected infection at the site of the procedure.
- This is because medical and dental procedures are no longer thought to be the main cause of endocarditis
- Taking antibiotics carries its own risk.



# Abx Prophylaxis Not Recommended



## Antibiotic Prophylaxis Against Infective Endocarditis Implementation Advice

This advice has been provided to facilitate the implementation of NICE Clinical Guideline 64 (CG64) *Prophylaxis Against Infective Endocarditis*.  
This advice does not replace NICE CG64.



Scottish Dental  
Clinical Effectiveness Programme

August 2018

NICE 2016 amendment introduced the term “Abx prophylaxis should not be used **routinely** prior to dental treatment”

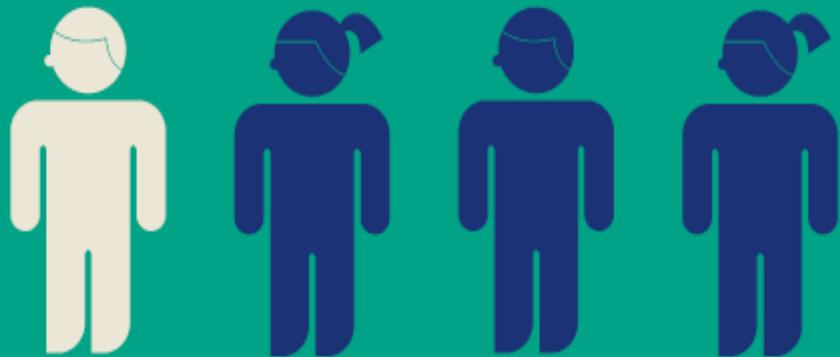
Allowed medical staff to use clinical judgement

Practical advice had been removed from BNF in 2008

This guidance is endorsed by NICE and they are meant to compliment each other

REMEMBER: NICE guidance remains that routine use of Abx is NOT recommended





A **quarter** of 5-year-olds have tooth decay with on average **3 or 4** teeth affected



The majority of tooth decay in children under 6 was untreated

There were **7,926** episodes of children aged under 5 years having 1 or more teeth extracted in hospital because of tooth decay



## Top 3 interventions for preventing tooth decay

1



**Reduce the consumption of foods and drinks that contain sugars**

2



**Brush teeth twice daily with fluoride toothpaste (1350-1500ppm), last thing at night and at least on one other occasion. After brushing, spit don't rinse**

3

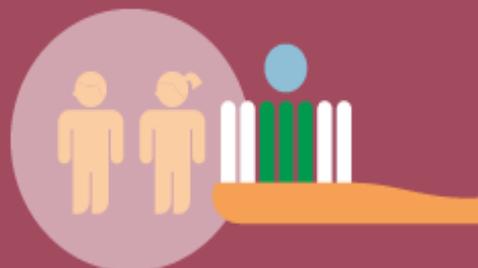


**Take your child to the dentist when the first tooth erupts, at about 6 months and then on a regular basis**

**Under 3s** should use a smear of toothpaste



**3 to 6 year olds** should use a pea sized amount



Parents/carers should brush or supervise tooth brushing until their **child is at least 7**

# Dental Advice for Children

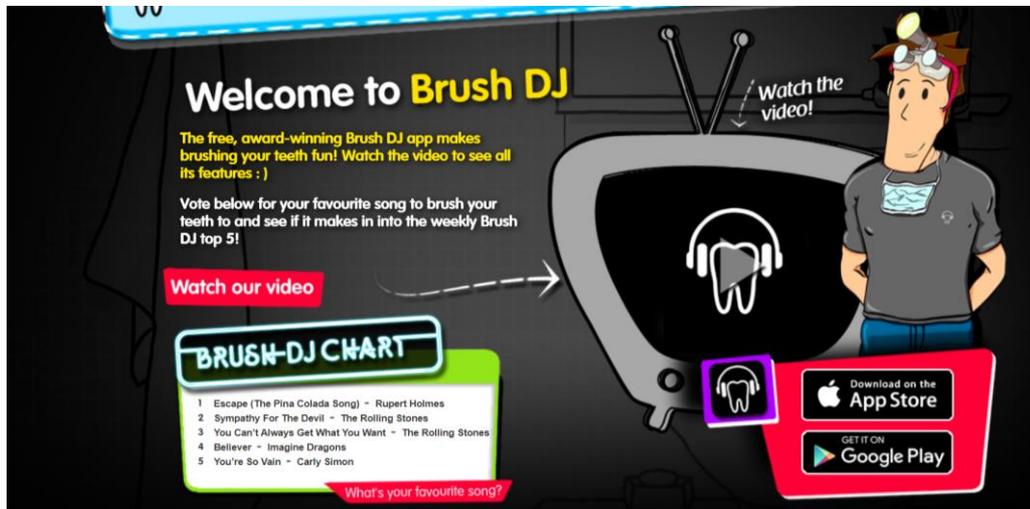


Tooth Brushing Song by Blippi | 2-Minutes Brush Your Teeth ...  
171M views · Oct 21, 2016

YouTube > Blippi - Educational Videos for Kids

Save Share

4:12



**Welcome to Brush DJ**

The free, award-winning Brush DJ app makes brushing your teeth fun! Watch the video to see all its features :)

Vote below for your favourite song to brush your teeth to and see if it makes in into the weekly Brush DJ top 5!

Watch our video

**BRUSH-DJ CHART**

- 1 Escape (The Pina Colada Song) - Rupert Holmes
- 2 Sympathy For The Devil - The Rolling Stones
- 3 You Can't Always Get What You Want - The Rolling Stones
- 4 Believer - Imagine Dragons
- 5 You're So Vain - Carly Simon

What's your favourite song?

Watch the video!

Download on the App Store

GET IT ON Google Play

[Children's teeth - NHS \(www.nhs.uk\)](http://www.nhs.uk)

# Body Piercings and Tattoos



- Teenage pressure!
- Popularity is increasing
- The skin is broken up to 150 times per second during a tattoo
- Endocarditis after tattooing remains rare
- Education of patients and body art professionals is vital
- Endocarditis infection after piercing is more common but still rare
- Consider site of piercing



# If you were to ask?

Most parents and some patients are aware that they should avoid piercings and tattoos and maintain good dental health

BUT

They have no idea why....



# Information

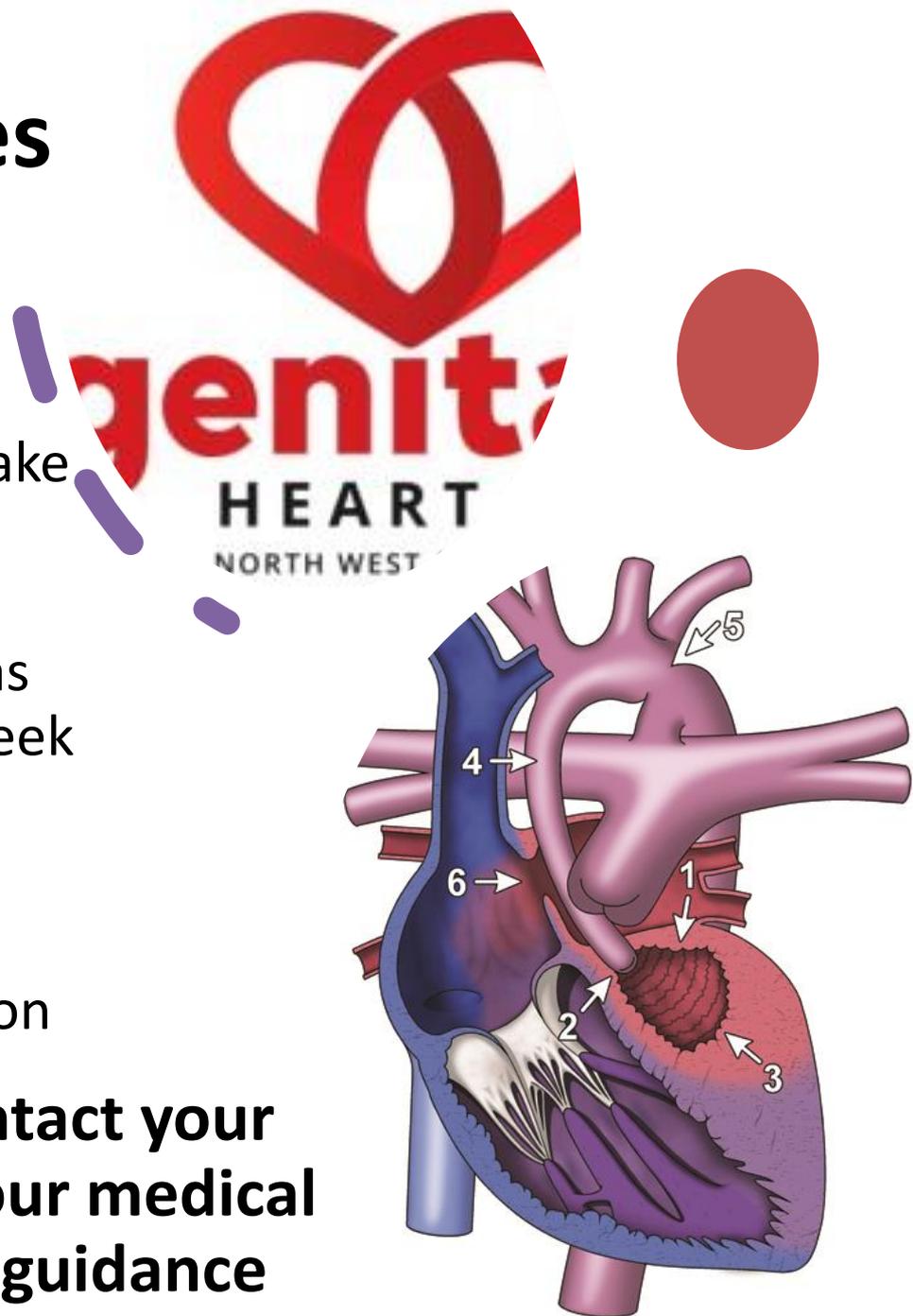
- Clear and Consistent
- Parents and should know what endocarditis is and what to look out for
- Know what to do and who to contact if they are worried
- The risks and benefits of Abx prophylaxis
- The importance of good dental hygiene
- The risks with tattoo's and body piercings
- Talk to patient themselves when old enough (during transition)



# Take Home Messages

- Suspect and rule out IE early
- NEVER give Abx if you do not know what you are treating – take blood cultures first
- If a patient is at high risk of contracting endocarditis and has been unwell for more than a week with an increased temperature they should be advised to see their GP in the first instance
- Everyone has a role in prevention

**If you aren't sure, ask, contact your local CNS team, speak to your medical team and follow national guidance**



# Where to find more information

- [Overview | Prophylaxis against infective endocarditis: antimicrobial prophylaxis against infective endocarditis in adults and children undergoing interventional procedures | Guidance | NICE](#)
- [Prophylaxis against infective endocarditis: summary of NICE guidance | The BMJ](#)
- [blippi teeth song - Bing video](#)
- [Health matters: child dental health - GOV.UK](#)
- [Children's teeth - NHS \(www.nhs.uk\)](#)
- [SDCEP Antibiotic Prophylaxis Implementation Advice](#)



