

# The Development and Implementation of a Preoperative Dental Screening Checklist for Pre-Cardiac Surgery Patients in ABUHB Community Dental Service



British Society of Gerodontology

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## INTRODUCTION

The European Society of Cardiology (2015) and the American Heart Association (2007) guidelines strongly recommend a preoperative dental screening (PDS) prior to cardiac surgery<sup>1,2</sup>. This is to eliminate foci of infection, decrease peri-operative infection and minimise infective endocarditis risk. ABUHB Community Dental Service (CDS) received 33 pre-cardiac surgery inpatient referrals in 2021 aged > 65 years. Referrals are expected to rise as valve replacement surgeries increases year on year<sup>3</sup>. CDS staff in ABUHB expressed concerns regarding assessment and treatment planning of pre-cardiac surgery patients. This project aims to address these concerns and improve the preoperative dental screening service.

## AIMS

- To develop a standardised dental pre-assessment checklist to ensure all necessary information is gathered from pre-cardiac valve surgery patients by staff.
- To develop evidence-based treatment planning recommendations for this patient group.
- To provide staff training in managing these cardiac patients.

## METHODOLOGY

Literature search completed to identify recommendations in preoperative dental screening and treatment with Medical Subject Heading terms: "preoperative dental screening" "dental treatment" "dental management" "dental surgery" "cardiac valve surgery" "valve replacement surgery" "Transcatheter Aortic Valve Implantations". Figure 1.

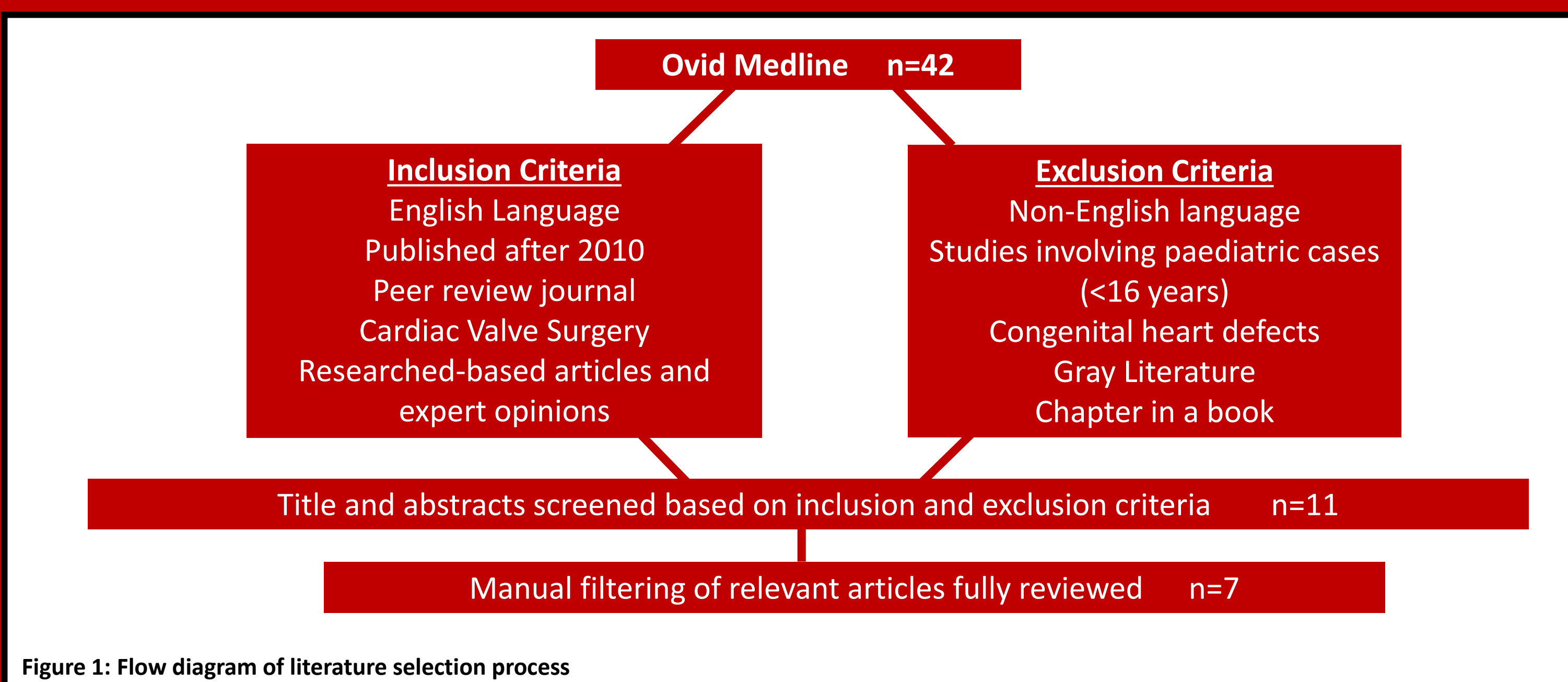


Figure 1: Flow diagram of literature selection process

## RESULTS

Seven key papers were used to develop the pre-assessment checklist (Figure 2) and treatment planning recommendations (Figure 4). This was distributed to the CDS, via email, to the clinical lead, two consultants in special care dentistry, four senior dental officers (SDO) and six community dental officers (CDO) for peer review and feedback (Figure 3). The checklist was amended and implemented in August 2021 following in-house staff training. It is currently being piloted within ABUHB CDS.

Figure 2: Preoperative Dental Screening for Cardiac Patients	
Patient:	DOB:
Address:	Date:
Cardiac consultant:	Referred by:
	Ward/hospital:
<b>Pre-assessment information</b>	<b>Assessment appointment</b>
<input type="checkbox"/> Has a GDP? <input type="checkbox"/> No GDP	<input type="checkbox"/> Confirm medical history
<input type="checkbox"/> GDP Details _____	<input type="checkbox"/> Medications/ allergies
<input type="checkbox"/> GDP Contacted	<input type="checkbox"/> ACORN
<input type="checkbox"/> Radiographs available from GDP: Y/N	<input type="checkbox"/> MDAS Score _____
<input type="checkbox"/> Last dental visit _____	<input type="checkbox"/> IE explanation
<input type="checkbox"/> Known dental problems/ PDH: _____	<input type="checkbox"/> Information Leaflet on IE (SDCEP) <a href="https://www.sdcep.org.uk/wp-content/uploads/2018/08/SDCEP-Antibiotic-Prophylaxis-Patient-Information.pdf">https://www.sdcep.org.uk/wp-content/uploads/2018/08/SDCEP-Antibiotic-Prophylaxis-Patient-Information.pdf</a>
<input type="checkbox"/> OPT <input type="checkbox"/> Provisional treatment plan: _____	<input type="checkbox"/> Bleeding Risk (SDCEP) <a href="https://www.sdcep.org.uk/published-guidance/anticoagulants-and-antiplatelets/">https://www.sdcep.org.uk/published-guidance/anticoagulants-and-antiplatelets/</a>
<b>Medical History:</b>	<input type="checkbox"/> Prevention (DBOH)
<input type="checkbox"/> Cardiologist/Medical Team _____	<input type="checkbox"/> TBI/OHI
<input type="checkbox"/> Cardiac Diagnosis _____	<input type="checkbox"/> Diet advice
<input type="checkbox"/> Cardiac Surgery _____ Date: _____	<input type="checkbox"/> NaF toothpaste 1.1% /0.619%
<input type="checkbox"/> Bleeding Risk _____	<input type="checkbox"/> Topical fluoride application
<input type="checkbox"/> Antibiotic Prophylaxis Y/N	<input type="checkbox"/> Smoking cessation
<input type="checkbox"/> If Yes, recommended antibiotic: _____	<input type="checkbox"/> 3/12 recalls <a href="https://www.gov.uk/government/publications/delivering-better-oral-health-an-evidence-based-toolkit-for-prevention">https://www.gov.uk/government/publications/delivering-better-oral-health-an-evidence-based-toolkit-for-prevention</a>
<input type="checkbox"/> Special Precautions from cardiology team: _____	Dental report to cardiology team:
<input type="checkbox"/> Other comorbidities _____	<input type="checkbox"/> Current state of patient's oral/dental health
<input type="checkbox"/> Medication _____	<input type="checkbox"/> Any acute or chronic issues
	<input type="checkbox"/> Treatment completed
	<input type="checkbox"/> Proposed dental treatment the patient refused to consent to
	<input type="checkbox"/> Future dental concerns and recommendations
	<input type="checkbox"/> Post-cardiac treatment dental maintenance

## REFERENCES

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- Lockhart PB, et al. Effect of dental treatment before cardiac valve surgery: systematic review and meta-analysis. *Journal American Dental Association* 2019; 150(9): 739-747.
- Cotti E, et al. Perioperative dental screening and treatment in patients undergoing cardiothoracic surgery and interventional cardiovascular procedures. A consensus report based on RAND/UCLA methodology. *International Endodontic Journals*. 2020; 53: 186-199.
- Rao N.R, et al. Preoperative dental screening prior to cardiac valve surgery and 90-day postoperative mortality. *Journal of Cardiac Surgery* 2020; 35(11):2995-3003.
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## DISCUSSION

The concerns raised by CDS staff are validated within the literature. The guidelines do not provide details of how a dental screening should be undertaken and it is difficult to establish if the benefit of treating a dental infection outweighs the risks involved in the procedure, due to conflicting evidence and limitations within studies<sup>4</sup>. Dental professionals should weigh up risks, benefits and case-specific factors and determine how they want to treat individuals until more definitive studies are published<sup>4</sup>. The checklist provides some "ground rules" which will support staff in their treatment planning decisions.

Cotti *et al.* (2020) developed a consensus report aimed to standardise the dental screening process<sup>5</sup>. An expert panel reached a substantial level of agreement (>80%) on a dental screening checklist. Rao *et al.* (2020) evaluated a focused comprehensive screening approach and found no difference on 90-day mortality after cardiac valve surgery<sup>6</sup>. A focused or modified treatment plan should be considered a viable option. In addition, Souza *et al.* (2017) makes specific recommendation on local anaesthetic, periodontal, restorative treatment, and management of inpatients<sup>7</sup>. This was all discussed during in-house staff training and important elements amalgamated into the development of the checklist and evidence-based recommendations. Further amendment were made following comments and suggestions to ensure the checklist was relevant to ABUHB CDS.

<p>"Use of topical anaesthetic is important to reduce discomfort, pain and anxiety during dental procedures. To be added to local anaesthetic clinical scenario and used as a stress reduction method in cardiac patients."</p> <p><b>Consultant</b></p>	<p>"Difficult extractions to be discussed with a consultant prior to Maxfax referral"</p> <p><b>Consultant</b></p>
<p><b>Comment and Suggestions</b></p>	
<p>"...a suggested clinical scenario - refusal of treatment"</p> <p><b>Consultant</b></p>	<p>"This looks brilliant-just what we need!"</p> <p><b>Community Dental Officer</b></p>

Figure 3: Feedback from CDS staff on figure 2 and figure 4.

Clinical Scenario	Evidence-based Recommendations
Local Anaesthetic	<input type="checkbox"/> Aspirating syringe <input type="checkbox"/> No evidence that an ID block poses a significant risk for an anticoagulated patient if below INR 4 <input type="checkbox"/> Use topical anaesthetic <input type="checkbox"/> Pre-operative or hospitalised patients: Max 2 x cartridges adrenaline containing LA then consider Citanest/Scandonest if further LA required. <input type="checkbox"/> Ensure adequate anaesthesia to minimise stress and anxiety – clinically risk assess increased LA required <input type="checkbox"/> Calcium channel blockers, beta-adrenergic blocking drugs, non-potassium sparing diuretics reduce LA to max 2 x cart adrenaline containing LA or max 3 cartridges of felypressin LA (UKMI) <input type="checkbox"/> Severe unstable cardiac patients: 1 <sup>st</sup> cartridge, wait 5 mins before 2 <sup>nd</sup> cartridge
Periodontal Disease	<input type="checkbox"/> Pocket depth ≥6mm, grade 2-3 mobile, periodontal abscess = XLA <input type="checkbox"/> Chronic periodontitis, without signs or symptoms of infection = Scale + OHI <input type="checkbox"/> Calculus =Scale and OHI
Restorative Treatment	<input type="checkbox"/> Caries removal and permanent restorations (time permitting otherwise stabilise) <input type="checkbox"/> Limited time consider ART and temporary restorations <input type="checkbox"/> Restorable teeth with periapical pathology treat endodontically <input type="checkbox"/> Limited time for endo, extirpate and dress with non-setting calcium hydroxide paste
Extractions	XLA: <input type="checkbox"/> Symptomatic teeth with periapical pathology (PAP) <input type="checkbox"/> Unrestorable teeth <input type="checkbox"/> Retained roots with PAP <input type="checkbox"/> Periodontal pockets ≥6mm <input type="checkbox"/> Grade 2-3 mobile Monitor: <input type="checkbox"/> Asymptomatic roots with no PAP <input type="checkbox"/> Root filled teeth/retained roots if asymptomatic <input type="checkbox"/> 2-3 extractions at one time <input type="checkbox"/> Full clearance – discuss with SCD specialist/consultant (may need Maxfax referral).
Difficult Extractions	<input type="checkbox"/> Discuss with SCD specialist/consultant
MDAS >15 (Severe anxiety)	<input type="checkbox"/> Very highly anxious adopt a modified treatment plan -eliminate foci of infection and <b>PREVENTION</b> <input type="checkbox"/> Risk reduction measures: rapport building, desensitisation, sufficient LA, behaviour management techniques, frequent breaks and reassurance, oral benzodiazepine premedication.
IHS	<input type="checkbox"/> Provide IHS in CDS with sedation skilled dentist
IVS	<input type="checkbox"/> Decision to be made by SCD specialist/consultant or referral to Maxfax
Refuse Treatment	<input type="checkbox"/> Discuss risks and benefits of options that have been advised but refused - record <input type="checkbox"/> SDCEP IE information leaflet <input type="checkbox"/> Letter to cardiologists <input type="checkbox"/> Assess capacity due to anxiety (retain, understand, weigh-up, communicate)
Deteriorating Patient	<input type="checkbox"/> Chest pain, SOB, increased respiratory rate, pale, clammy, nausea, vomiting, decreased BP, weak pulse <input type="checkbox"/> STOP, DR ABCDE, 100% O <sub>2</sub> 15L/min, Chest pain GTN spray 2 puff repeat 3 mins, Aspirin 300mg chewed <input type="checkbox"/> Responds to emergency treatment return to hospital, if continued deterioration 999.

Figure 4: Evidence-based treatment planning recommendations for pre-cardiac surgery patients

## CONCLUSION AND FUTURE PLANS

Following this pilot, the checklist and recommendations (Figure 2 and 4) will be evaluated in three months via staff satisfaction questionnaires, to ensure concerns raised have been addressed appropriately. The checklist will be discussed at South East Wales Managed Clinical Network to aid in the cardiac surgery care pathway development across dental services. Further research is needed to evaluate whether dental treatment should be radical or conservative in cardiac surgery patients<sup>4</sup>. Until then, figure 2 and 4 hopes to support ABUHB CDS staff manage this complex patient group.