

Restorative Options Decision Tree: A consensus of experts to guide the selection of restorative materials in the context of amalgam phase down

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With a large variety of restorative materials available for both direct and indirect restorations, the selection process has become a challenge for the dentist. With a high demand from the patients for tooth-colored restorations as well as the trend toward minimally invasive dentistry and the amalgam phase-down (Minamata convention), the days of amply drilling and easy restoring with amalgam are nearly over. Yet, many dentists consider composite materials time and technique sensitive, with varying handling properties and several steps.

The management board of Foundation Nakao has initiated the “Restorative options decision tree” project to support the amalgam phase-down by providing dentists with clear options of alternatives to amalgam. In line with these ideas, and focusing on tooth-preserving procedures, the **experts of the Foundation Nakao management board** joined forces and kicked off the “Restorative options decision tree” project on the 19th of March 2020. The decision tree presents their consensus to guide dentists in selecting the appropriate restorative materials not only according to physical and clinical properties, but also considering key aspects such as time and cost efficiency, patients comfort and expectations.

The decision tree was created considering several parameters. These included, the site of the restoration (anterior, posterior or cervical), condition of the remaining tooth structure, depth/size of the lesion, possibility to isolate, caries risk factors, economic considerations amongst the handling, physical and clinical properties of the restorative options. It was after four steps from the first meeting till its final approval, (Fig. 1) the decision tree was finalized.

In order to address the different direct and indirect restorative options, a comparison table of restorative materials was created and transformed into a decision tree.

Overview: [Anterior](#) [Posterior](#) [Cervical](#)

After alignment of the board members this decision tree was translated into the online user-friendly “Restorative Options Decision Tree” .

The Restorative Options Decision Tree is an easy and useful tool to guide clinicians towards the correct restorative materials, taking into consideration aesthetic, costs and preservation of the tooth structure. The experts invite clinicians from all over the world to give it a try and to provide their comments !

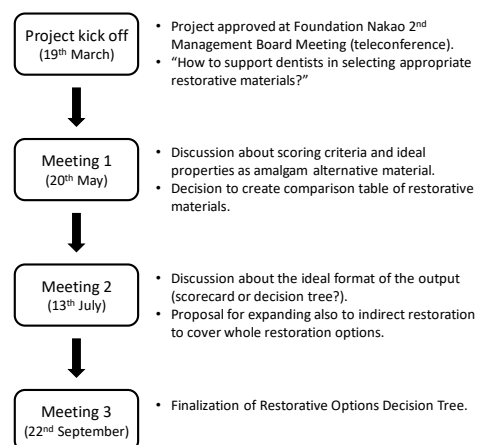


Fig. 1. Four key phases of this process.

Cavity type	Condition	Caries removal	Vitality	Isolation	Caries risk	First option	Second option
Class III		Complete caries removal possible		Isolation possible	Low/medium	Composite	Glass hybrid
					High	RMGIC	Composite
				Isolation not possible		RMGIC	Glass hybrid
		Non complete caries removal close to pulp		Low/medium	Sandwich technique	Glass hybrid	
					High	Glass hybrid	GIC
Class IV	Labial tooth structure mainly damaged					Veneer	Composite
	large lesions, Little tooth structure remaining		Vital tooth			Crown	Composite
			Non-vital tooth (endo treated)			Post and prosthetic work	Composite

Vitality	Caries removal	Cavity type	Caries risk	Isolation	Other factors	First option	Second option
Vital tooth	Complete caries removal possible	Small-medium	Low/medium	Isolation possible		Composite	Glass hybrid
				Isolation not possible		Glass hybrid	Sandwich technique
			High	Isolation possible		Glass hybrid	Composite
				Isolation not possible		Glass hybrid	Sandwich technique
		Large (no missing cusp)	Low/medium	Isolation possible		Composite (Fiber reinforced)	Sandwich technique
				Isolation not possible		Glass hybrid	Sandwich technique
			High	Isolation possible		Glass hybrid	Composite
				Isolation not possible		Glass hybrid	Sandwich technique
		Large (cusp/cusps missing)	Low/medium	Isolation possible	Cost efficient treatment	Composite	Sandwich technique
					High end treatment	Indirect restoration (Inlay, Onlay)	Composite
			High	Isolation not possible		Sandwich technique	Indirect restoration (Inlay, Onlay) and cementation
				Isolation possible		Sandwich technique	Composite
	Non complete caries removal close to pulp	Small-medium	Low/medium	Isolation possible		Glass hybrid	Composite
				Isolation not possible		Glass hybrid	Sandwich technique
			High	Isolation possible		Glass hybrid	Composite
				Isolation not possible		Glass hybrid	Sandwich technique
Large		Low/medium	Isolation possible		Composite	Sandwich technique	
			Isolation not possible		Sandwich technique	Indirect restoration (Crown) and cementation	
		High	Isolation possible		Composite	Indirect restoration (Crown)	
			Isolation not possible		Sandwich technique	Indirect restoration (Crown) and cementation	
Non-vital tooth (endo treated)	Good retention possible from pulp chamber (50% coronal structure remaining)	Isolation possible			Composite	Core build-up + Composite	
		Isolation not possible			Sandwich technique	Indirect restoration (Crown) and cementation	
	Limited retention from pulp chamber (Less than 50%)			Cost efficient treatment	Core build-up + Composite		
				High end treatment	Core build-up + indirect restoration (Inlay, Onlay)	Core build-up + indirect restoration (Crown)	
	No retention possible from pulp chamber (Limited ferrule or none)					Post and Core build-up + indirect restoration (Crown, Onlay)	

Caries removal	Caries risk	Isolation	Other factors	First option	Second option
Complete caries removal possible	Low/medium	Isolation possible	Normal dentin	Composite	RMGIC
			Sclerotic dentin	Glass hybrid	RMGIC
		Isolation not possible		Glass hybrid	RMGIC
	High	Isolation possible		Glass hybrid	Composite, RMGIC
		Isolation not possible		Glass hybrid	RMGIC
Non complete caries removal close to pulp				Glass hybrid	RMGIC