



ICCMS™ Quick Reference Guide for Practitioners and Educators

This HEALTH OUTCOMES FOCUSED SYSTEM presents a
Caries Management Cycle that aims:

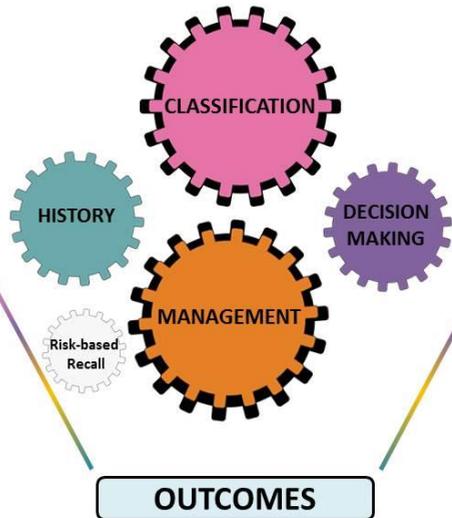
- To **prevent new caries lesions** from appearing
 - To **prevent existing caries lesions** from advancing further
 - To **preserve tooth structure with non-operative care at more initial caries stages and conservative operative care at more extensive caries stages**
- While **managing risk factors** and **recalling patients at appropriate intervals**, with **periodic monitoring and reviewing**.

Uses a simple form of the ICDAS Caries **Classification** model to stage caries severity and assess lesion activity

ICCMS™

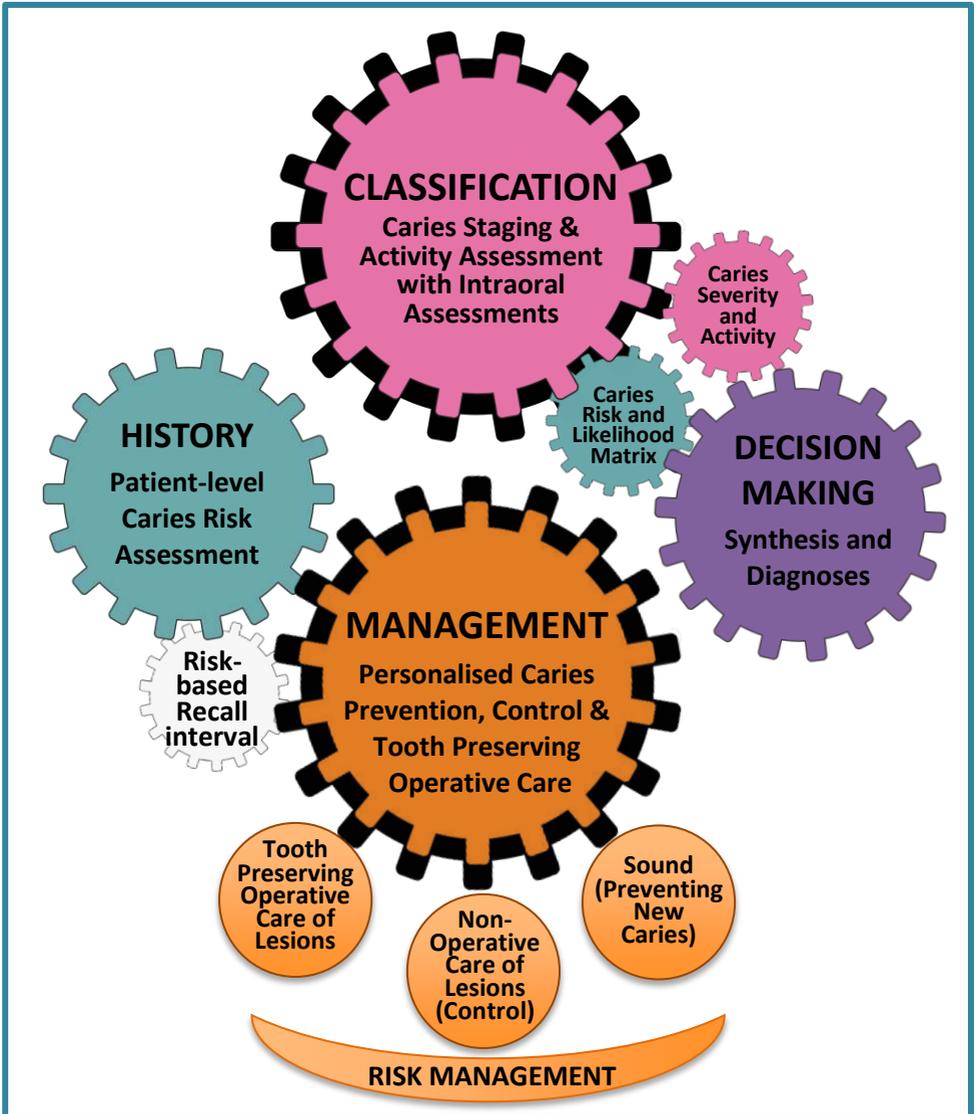
in order to

Derive an appropriate, personalised, preventively based, risk-adjusted, tooth preserving **Management Plan**.



This ICCMS™ Quick Reference Guide includes a comprehensive set of clinical protocols (drawn up based on the best available evidence) to support history taking, clinical examination, risk assessment and personalised care planning in order to enable improved long-term caries outcomes.

The Four ICCMS™ Elements, shown with detailed description of their components and linked by risk-based recall.



The Caries Management Pathway is cyclical as each element follows on in turn. The figure aims to demonstrate a recommended method of implementation. The cycle restarts after each risk based recall interval.

Element 1- History: Patient-Level Caries Risk Assessment

Prior to looking into the mouth, and having ensured that there are no urgent pain related issues, patient risk factors for caries are assessed.

Patient level caries risk factors

- **Head and Neck Radiation**
- Dry mouth (conditions, medications/recreational drugs/self report)
- Inadequate oral hygiene practices
- Deficient exposure to topical fluoride
- High frequency/ amount of sugary drinks/ snacks
- Symptomatic-driven dental attendance
- Social-economic status/Health access barriers
- For children: high caries experience of mothers or caregivers

Note: Risk factors in red will always classify an individual as high caries risk.

Element 2- Classification: Caries Staging and Lesion Activity with Intraoral Caries Risk Assessments

Plaque is assessed for intraoral caries risk determination, but has to be removed for accurate caries staging and lesion activity assessment.

Assessment of Caries Risk Factors Intraorally

Intraoral level caries risk factors

- **Hypo-salivation/Gross indicators of dry mouth**
- **PUFA (Exposed pulp, Ulceration, Fistula, Abscess) – Dental sepsis**
- Caries experience
- Thick plaque: Evidence of sticky biofilm in plaque stagnation areas
- Appliances, restorations and other causes of increased biofilm retention
- Exposed root surfaces

Note: Risk factors in red will always classify an individual as high caries risk.

These risk factors correspond to those with higher association with caries risk status. The calculation of the patient's caries risk status (low, moderate, high) can be done with available tests or computer-based systems, such as CAMBRA and Cariogram.

Staging lesions

The assessment of caries will always be conducted by means of visual examination and when possible, combined with radiographic examination.

Definition of ICCMS™ Caries Merged categories			
Caries categories	<p>Sound surfaces (ICDAS code 0)</p>		<p>Sound tooth surfaces show no evidence of visible caries when viewed clean and after prolonged air-drying (5 seconds).</p>
	<p>Initial stage caries (ICDAS codes 1 and 2)</p>		<p>First or distinct visual changes in enamel seen as a carious opacity or visible discolouration (white spot lesion and/or brown carious discolouration) not consistent with clinical appearance of sound enamel (ICDAS code 1 or 2).</p>
	<p>Moderate stage caries (ICDAS codes 3 and 4)</p>		<p>A white or brown spot lesion with localised enamel breakdown, without visible dentine exposure (ICDAS code 3), or an underlying dentine shadow (ICDAS code 4), which obviously originated on the surface being evaluated.</p>
	<p>Extensive stage caries (ICDAS codes 5 and 6)</p>		<p>A distinct cavity in opaque or discoloured enamel with visible dentine (ICDAS code 5 or 6).</p>

ICCMS™ Combined Categories: Combining clinical and radiographic information

Eventually, both the radiographic (when available and for posterior teeth) and the clinical assessment of the lesion severity caries merged categories end up classifying the lesion into the categories of initial, moderate or extensive.

ICCMS™ Combined Categories (C)	Radiographic Categories (R)				
	<i>R₀</i> 	<i>RA₁₋₂</i> 	<i>RA₃</i> 	<i>RB</i> 	<i>RC</i> 
<i>C_{Sound}</i>	Sound _{CR}	Initial _{CR}	Initial _{CR}	Moderate _{CR}	Extensive _{CR}
<i>C_{Sound}</i>	Initial _{CR}	Initial _{CR}	Initial _{CR} or Moderate _{CR}	Moderate _{CR}	Extensive _{CR}
<i>C_{Moderate}</i>	Moderate _{CR}	Moderate _{CR}	Moderate _{CR}	Moderate _{CR} or Extensive _{CR}	Extensive _{CR}
<i>C_{Extensive}</i>	Extensive _{CR}	Extensive _{CR}	Extensive _{CR}	Extensive _{CR}	Extensive _{CR}

R1-2 occlusal cannot be seen on a radiograph due to too much sound enamel around

Lesion activity assessment

Caries lesions can be detected and assessed at an early stage as initial lesions. These, and also lesions at a further stage of severity, can be progressing at the moment of the clinical examination. Therefore, the next step after the severity assessment of the caries lesions is to judge if these, irrespective of stage, are inactive or active.

ICCMS™ Caries Codes	Characteristics of Lesion	
	Signs of Active Lesions	Signs of Inactive Lesions
ICCMS™ Initial and Moderate Caries Stage	<p>Surface of enamel is whitish/yellowish; opaque with lustre loss, rough.</p> <p>Lesion in a plaque stagnation area. The lesion may be covered by thick plaque prior to cleaning.</p>	<p>Surface of enamel is whitish, brownish or black; enamel may be shiny, hard and smooth. For smooth surfaces, the caries lesion is typically located at some distance from the gingival margin. Lesion may not be initially be covered by thick plaque.</p>
ICCMS™ Extensive Caries Stage	<p>Dentine feels soft or leathery on gentle probing.</p>	<p>Dentine is shiny and hard on gentle probing.</p>

Element 3- Decision Making: Synthesis and Diagnosis

The third step of the diagnosis process involves the summation and analysis of information from the first two elements, regarding both the patient and the lesion level. The result will be the synthesis and diagnosis of the likelihood of new/progressing lesions in low, moderate or extensive risk status, and of each lesion in terms of whether or not they are active and if they are of initial, moderate or extensive severity.

ICCMS™ caries diagnosis

Classification of individual lesions combining information about their stage and activity (e.g. 'initial' active lesion):

ICCMS™ Caries Codes	Activity Status	
	Active Lesions	Inactive Lesions
ICCMS™ Initial	Initial Active	Initial Inactive
ICCMS™ Moderate	Moderate Active	Moderate Inactive
ICCMS™ Severe	Extensive Active	Extensive Inactive

Note: Combined clinical and radiographic (where available) information.

ICCMS™ caries risk analysis to assess likelihood of new lesions or caries progression

The consensus view is that risk assessment should be conducted as an integral part of the personalised caries care plan.

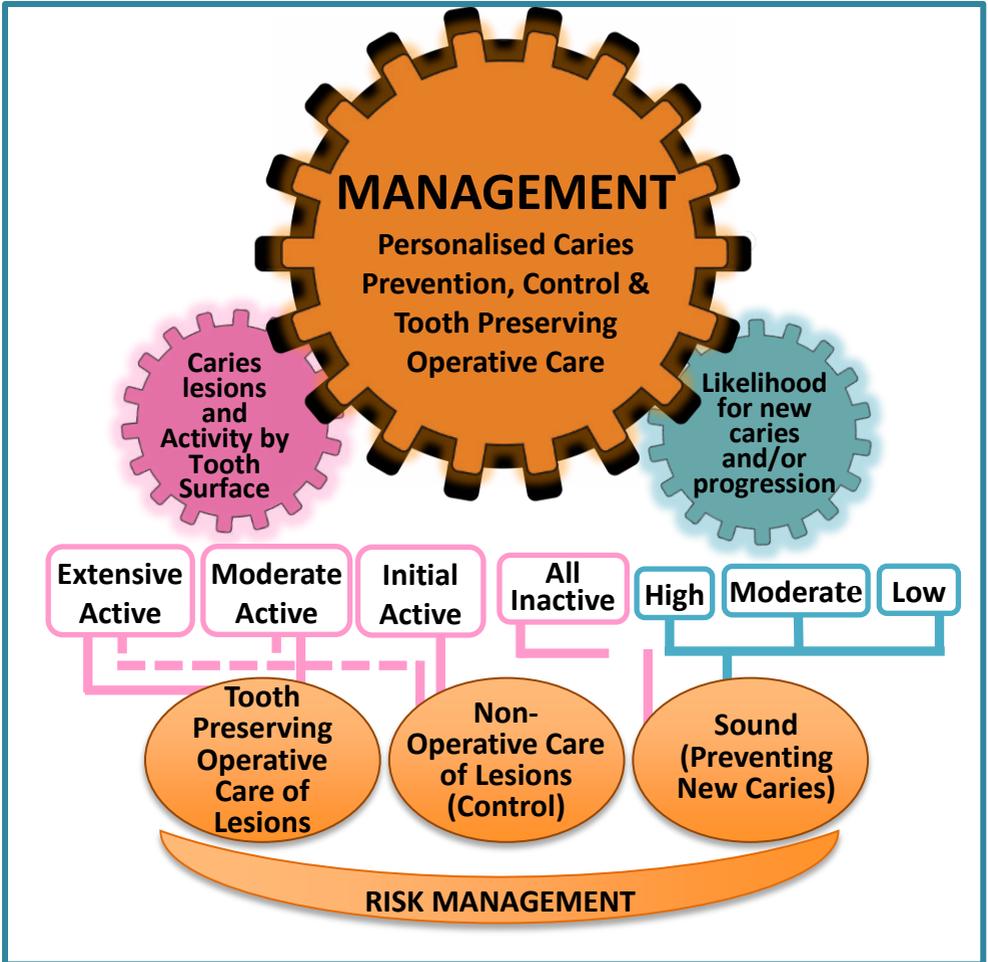
ICCMS™ Caries Risk and Likelihood Matrix		Current Caries Activity Status at the Patient Level		
		No active caries lesions*	Initial stage active caries lesions	Moderate or extensive stage active caries lesions
Risk Status	Low risk	Low likelihood	Moderate likelihood	Moderate likelihood*
	Moderate risk	Low likelihood	Moderate likelihood	High likelihood
	High risk	Moderate likelihood	High likelihood	High likelihood

*Sound surfaces and/or inactive lesions

Element 4- Management: Personalised Caries Prevention, Control & Tooth Preserving Operative Care

It involves and interconnects:

- Managing patient's likelihood for new caries and/or progression
- Managing individual caries lesions, with caries related treatment when they are active, defining different options according to their severity.



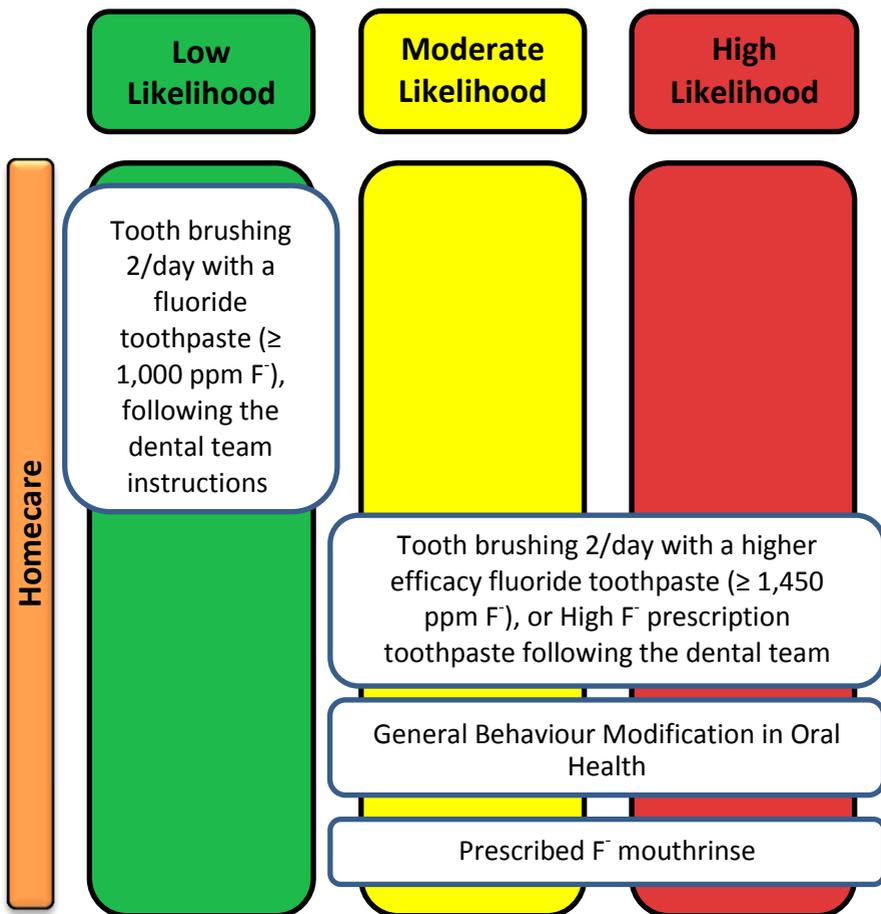
The Management Element Includes:

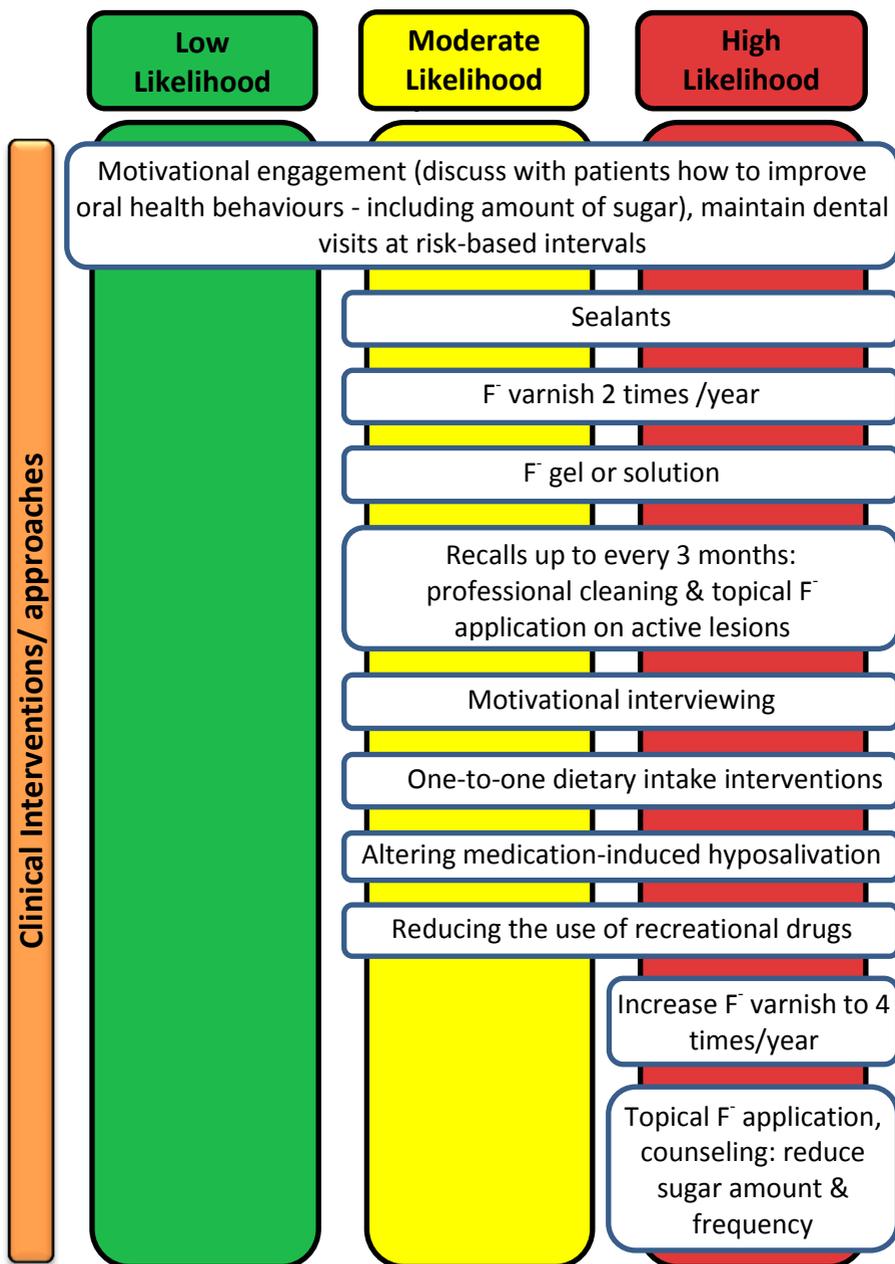
- Preventing New Caries
- Non-Operative Care of lesions (NOC) (Control)
- Tooth Preserving Operative Care of lesions (TPOC).

Managing a patient's risk factors

The patient's caries risk factors management plan involves **actions to protect sound tooth surfaces from developing new caries lesions, and all current active and inactive lesions from progressing**. In addition, it aims to **lower the risk status of the patient when moderate or extensive, and to maintain if low**. Based on the best available evidence, and depending on the caries risk likelihood status, ICCMS™ recommends the activities shown below, to choose from. The intensity of the intervention is cumulative.

Note: Local adaptations may be required.





Note 1: In some countries, chlorhexidine may be considered as a preventive treatment option. Note 2: This guide is provided as an overview for all age groups. Later developments of specific versions targeted for narrower age groups would be useful.

Note 3: Local regulatory requirements & professional recommendations may modify fluoride concentrations in topical products.

Note 4: Head & neck radiation, dry mouth – hyposalivation, and PUFA signs, indicate the need for special care, including additional measures.

Note 5: The frequency of preventive care should increase for the High Likelihood

Managing Individual Lesions

The 'Managing Individual Caries Lesions' plan is tailored to the lesion level.

The ICCMS™ Caries Diagnosis table (from Element 3) is applicable to caries management decisions. The level of intervention depends on the clinical caries classification of the surface or tooth and the radiological extent (when information is available) of the lesion in enamel or dentine.

The levels of clinical management recommended for active lesions are defined as follows:

M-Initial: Initial caries management stage: Non-Operative Care (NOC) – Control.

M-Moderate: Moderate caries management stage: Non-Operative Care of lesions (NOC), or more frequently, Tooth Preserving Operative Care of lesions (TPOC).

M-Extensive: Extensive caries management stage: in general Tooth Preserving Operative Care of lesions (TPOC).

Review and monitoring visits (or recalls)

The duration of personalised intervals between visits to review and monitor a patient's caries status should be considered. The Recall interval is based on age (eruption pattern and other milestones) and risk (based on lesion level as well as overall patient level). ICCMS™ differentiates between recall intervals set for overall risk management, for assessing preventive interventions and the monitoring of initial lesions (to check their progression status) and reviews of behavioural and oral hygiene change plans.

For coronal caries in the primary dentition, caries management recommendations are dependent on the cooperation level of a child and time to exfoliation.

The recommended management matrix for coronal caries in permanent/primary dentition is as follows:

ICCMS™ Stage	INDIVIDUAL CARIES LESIONS MANAGEMENT
M_{Sound}	Risk-based Prevention (Refer to Previous Section)
M_{Initial} Active	<p>NOC</p> <ul style="list-style-type: none"> Clinically applied topical F⁻ (for ≤ 6-yr. old children particularly, F⁻ varnish is recommended) Oral hygiene with F⁻ dentifrice (≥1000 ppm) from first tooth eruption Mechanical removal of biofilm. Supervision is recommended at least until the age of 8 years Resin-based sealants / glass ionomer sealants (In interproximal surfaces: Resin-based sealants / infiltrants)
M_{Initial} Inactive	No lesion-specific treatment
M_{Moderate} Active	<p>NOC</p> <ul style="list-style-type: none"> Resin-based sealants** If sealant not feasible (teeth isolation difficulties) an option for primary teeth is a non-tooth preparation preformed metal/strip crown <p>TPOC</p> <ul style="list-style-type: none"> Including (for primary teeth) placement of preformed metal or strip crowns <p>In interproximal surfaces: Determine cavitation presence by tooth separation:</p> <ul style="list-style-type: none"> No cavitation: NOC Cavitation: TPOC (+ preformed metal/strip crowns in primary teeth)
M_{Moderate} Inactive	TPOC if the lesion is a PSA or the area is aesthetically unacceptable
M_{Extensive} Active	<p>TPOC: Including (for primary teeth) placement of preformed metal or strip crowns</p> <p>In primary teeth: If standard TPOC is not possible, consider the Hall Technique or extraction</p>
M_{Extensive} Inactive	TPOC if the lesion is a PSA or the area is aesthetically unacceptable

NOC: Non-Operative Care. TPOC: Tooth Preserving Operative Care. * PSA = Plaque stagnation area.

**If preferred restorative care is not yet feasible because of patient or tooth factors, an alternative treatment is to apply a glass ionomer-based sealant.



This Quick Reference Guide has been taken from the ICCMS™ Guide for Practitioners and Educators document published December 2014.

Please refer to the ICDAS-ICCMS™ webpage for further information:
<https://www.icdas.org>

The ICCMS™ System will be supported by a range of documents and tools which are currently released or under development. These include:

1. The ICCMS™ Guide for Practitioners and Educators.
2. This ICCMS™ Quick Reference Guide, a short “how to”.
3. The ICCMS™ Resource Book - which will cover the ICCMS™ and further supporting evidence and practical considerations in more detail.
4. ICDAS/ICCMS™ Updated E-learning tool
5. ICCMS™ iCaries Care practice support software APP.
6. ICCMS™ iCaries Care patient support software APP.
7. ICCMS™ Caries Care patient support paper-based tools.

Further Implementation tools should be produced and evaluated in due course as part of the Global Collaboratory for Caries Management initiative (GCCM) – supported by King’s College London and the other participating Universities and Associations in collaboration with supporting Companies.

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