

# A protocol for a systematic review of clinical guidelines and published systematic reviews on the early detection of oral cancer

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## Abstract

**Background:** The predicted increase in incidence of oral cavity cancer (OCC) coupled with high mortality and poor prognosis – particularly when diagnosed at a late/advanced stage – highlights the need for prevention and early detection/screening to reverse these trends. Dental healthcare professionals in primary care settings have a pivotal role in this effort.

**Aim:** The aim of this protocol is to detail the process for assessing the evidence for the best practice and methods of early detection/screening for OCC in primary care dental settings by undertaking a systematic review of global clinical guidelines and published systematic reviews.

**Method:** Searches for clinical guidelines and systematic reviews will be conducted in the following databases: Cochrane library, Medical Literature Analysis and Retrieval System Online (Ovid), Excerpta Medical dataBASE, PubMed, Turning Research into Practice, SCOPUS and Web of Science Core Collection. Our search will extend to include Google Scholar and international professional organizations/associations websites. In addition, we will handsearch the bibliographies and undertake citation searches of the selected papers. Quality appraisal will be undertaken using the Appraisal of Guidelines for Research and Evaluation version II instrument for the clinical guidelines and both A Measurement Tool to Assess Systematic Reviews and Risk of Bias in Systematic Reviews tools for the systematic reviews. A narrative synthesis approach will be used to assess the evidence of extracted data, primarily taking account of quality appraisal and recency of publication.

**Discussion:** The synthesis of evidence will determine best practice for OCC early detection/screening by primary care dental healthcare professionals and will evaluate the relationship between clinical guidelines and the evidence base available from systematic reviews in this area.

## Keywords

Oral cavity cancer, oral neoplasm, oral cancer screening, oral examination, dental professionals, clinical guidelines, systematic reviews

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## Background

### *Incidence and mortality*

Oral cavity (mouth) cancers (OCC) are defined by the World Health Organization International Classification of Diseases and Related Health Problems (ICD-10 edition) codes<sup>1</sup> to include cancers of the inner surface of the lips (C00.3–C00.9, excluding external surface), other and unspecified parts of

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tongue (C02, excluding base of tongue C01), the gum (C03), floor of mouth (C04), palate (C05) and other and unspecified parts of mouth (C06). Cancers of the salivary glands and cancers of the oropharynx (throat) are excluded from the definition and beyond the remit of this review.

Globally, there were an estimated 300,373 new cases of OCC diagnosed and 145,353 deaths recorded in 2012.<sup>2</sup> Incidence rates vary worldwide, and while they are consistently higher among men, there is a general trend for increasing incidence of OCC among women with relatively stable or only marginal increases among men.<sup>3</sup> In England, a population-based cancer registry analysis found a 77% increase in OCC between 1955 and 2011 and projected a further increase of 3% per year to 2025 in both sexes.<sup>4</sup> OCC is recognized as a devastating disease with substantial impact for individuals, families, healthcare providers and wider society.<sup>5</sup> The predicted increase in incidence, coupled with high mortality and poor prognosis of OCC – particularly when diagnosed at late/advanced stage – highlights the need for prevention and early detection/screening to attempt to reverse these trends.

### **Risk factors**

The major recognized behavioural risk factors for OCC include smoking, alcohol consumption and diets low in fresh fruit and vegetables,<sup>6</sup> while sociodemographic factors including age (older adults), gender (male) and low socioeconomic status are also considered substantially important.<sup>7</sup> Evidence is also emerging on the role of genetic variants<sup>6</sup> and poor oral health and dental care.<sup>8</sup> Oral human papillomavirus infection seems to have a limited role in OCC, being mainly implicated in the aetiology of the distinct disease of oropharyngeal (throat) cancer.<sup>9,10</sup>

### **Survival rate and early detection**

There has been limited improvement in the 5-year survival rate from OCC in the last few decades.<sup>11,12</sup> A recent meta-analysis confirmed that delay from first symptom to referral for diagnosis is a risk factor for advanced stage presentation and subsequently poorer mortality of oral cancer.<sup>13</sup> Therefore, conversely, early detection/screening, including symptom recognition and clinical examination of the oral mucosa together with assessment of risk factors, can potentially improve prognosis. This has been evidenced by a large randomized control trial in Kerala, India, which demonstrated that oral visual screening in community settings by healthcare support workers can reduce mortality associated with OCC in high-risk (users of tobacco and alcohol) individuals, albeit in a high-incidence country.<sup>14</sup>

### **Screening/early detection**

Screening is the process of detecting disease early via undertaking a screening test. Such a test is not in itself diagnostic but indicates increased risk of developing the disease or identifies

the presence of early stages of disease progression (with or without obvious signs or symptoms). A positive screening test finding indicates the need for referral for definitive diagnostic tests and early interventions.

In countries with universal (population coverage) primary care dental services, dental healthcare professionals have a role in providing ‘opportunistic’ screening/early detection via visual conventional oral examinations as part of routine dental services. This is often included in recommendations from dental organizations or societies (e.g. Scottish Intercollegiate Guidelines Network (SIGN))<sup>15</sup> and is an expectation of dental regulatory bodies (e.g. General Dental Council in the United Kingdom).<sup>16</sup> These recommendations are communicated through clinical guidelines for dental healthcare professionals working in primary care and have been developed by a range of different health and professional organizations and agencies worldwide (e.g. US Preventive Service Task Force,<sup>17</sup> American Cancer Society<sup>18</sup> and SIGN).<sup>16</sup> However, our initial search of the literature and clinical guidelines indicated a lack of consensus between the clinical guidelines and insufficient evidence in the literature on providing direction to dental healthcare professionals on the details of the early detection/screening process. This includes the nature/description of assessment (conventional clinical oral examination, frequency of assessment/recall), the use of the adjunct tools (e.g. vital staining, light-based detection, biomarkers and brush biopsy), setting and whether the approach should be a targeted (i.e. to high-risk patients stratified/determined by sociodemographic/behavioural risk factors) versus a population (i.e. universal to all patients) approach. In addition, the extent to which the guidelines have included the highest quality evidence, and indeed have adopted a robust literature search, and quality appraisal is uncertain. Therefore, there is a need to assess the relevant clinical guidelines and systematic reviews in this field using a systematic approach to provide clarity for primary care dental healthcare teams on the best early detection/screening practice for OCC and potentially malignant disorders.

### **Aims/objectives**

The aim of this protocol is to detail the process for assessing the evidence for the best methods for early detection/screening for OCC (and by implication potentially malignant disorders) in the primary care dental setting by undertaking a systematic review of clinical guidelines and systematic reviews.

The dental healthcare professionals in this systematic review include dentists, dental therapists and dental hygienists working in primary care community healthcare settings.

The Population, Intervention, Comparator, Outcome and Setting model<sup>19</sup> was used to develop the following review question:

What clinical examination methods for early detection/screening of OCC are considered best practice for dental healthcare professionals when assessing patients attending primary care dental settings, including description of the clinical examination; frequency of the assessment; use of adjunct

methods and whether the approach should be population, opportunistic or targeted based on risk factors?

### Objectives

- To systematically search for evidence including systematic reviews and clinical guidelines in relation to early detection/screening for OCC in primary care dental settings.
- To appraise the quality of the evidence using assessing the methodological quality of systematic reviews (AMSTAR) and risk of bias in systematic reviews (ROBIS) tools for the systematic reviews and the Appraisal of Guidelines for Research and Evaluation version 2 (AGREE II) instrument for the clinical guidelines.
- To describe the clinical examination/assessment process, frequency of the assessment, use of the adjunct methods, the applicability to dental setting and the approach (opportunistic – universally to all patients; or targeted/focused/different (e.g. more intensive) based on patient’s risk factors).
- To synthesize the evidence of the extracted data from the systematic reviews and clinical guidelines primarily taking account of the quality appraisal and recency of publication. This will lead to the development of (based on the best available evidence) recommendations for OCC early detection/screening processes for primary dental healthcare professionals.

### Methods

We referred to the Preferred Reporting Items for Systematic review and Meta-Analysis – Protocols (PRISMA-P) 2015 statement, other published protocols<sup>20</sup> and systematic reviews<sup>21,22</sup> to develop this protocol. The PRISMA-P 2015 check list is included in Online Appendix 1.

### Eligibility criteria

**Types of study.** Our overview study will include evidence from systematic reviews and clinical guidelines in relation to early detection/screening for OCC in primary care dental settings. Both clinical guidelines and systematic reviews are likely to include specific recommendations and evidence on OCC early detection/screening for dental healthcare professionals in primary care settings. Our search will include peer-reviewed and grey literature and will not be restricted to any language. The systematic reviews will be searched from 1946 to current date and the clinical guidelines will be sought from 2000. We will exclude case studies/reports, published abstract only and systematic review protocols.

**Types of participants.** The population group for this overview will be the adult population (including high-risk group individuals) who attend primary care dental settings.

**Types of interventions.** This will include early detection/screening interventions for detecting OCC by dental healthcare professionals in the primary care dental settings. These interventions will include conventional clinical oral examinations along with other adjunct methods (such as vital rinsing/staining, light-based detection, blood and saliva biomarker analysis and brush biopsy).

*This study will intend to achieve the following outcomes:*

- Evidence for effectiveness of interventions (e.g. does early detection/screening decrease the incidence rates of OCC; does early detection/screening improve the stage of diagnosis and/or improve mortality rates and what could be the harms of the screening or is it cost effective?).
- Description of an evidence-based preventive intervention (i.e. description of the clinical oral examination; frequency of the assessment; use of adjunct methods and whether the approach should be population, opportunistic or targeted based on risk factors).

**Types of setting.** This study will focus on applicability to primary care (community) dental settings.

### Information sources

A systematic review for clinical guidelines and systematic reviews in the worldwide literature will be performed with the medical subject librarian (HW-A) in the following databases: Cochrane Library from 1966 to present, Medical Literature Analysis and Retrieval System Online (MEDLINE) from 1946 to present, Excerpta Medical dataBASE (EMBASE) from 1947 to present, Web of Science Core Collection: Citation Indexes from 1900 to present, PubMed (a free search engine accessing primarily the MEDLINE database of references and abstracts on life sciences and biomedical topics) from 1946 to present, SCOPUS (a bibliographic database containing abstracts and citations for academic journal articles) from 1966 to present and Turning Research into Practice (TRIP) from 2000 to present.

Professional organizations/associations websites from around the world will be searched for additional global clinical guidelines in relation to OCC early detection. A list of professional organizations/associations is included in Online Appendix 2. Despite the limitations in searching on Google in relation to language, geographical biases and lack of replicability, a list of target phrases will be run in Google searches to discover grey literature in the form of web-published guidelines from official bodies. Online Appendix 3 includes list of phrases used for Google search.

The reference lists of the selected papers will be hand-searched for additional studies. In addition, we will conduct citation searches in Google Scholar and Web of Science of the selected papers to identify further systematic reviews and clinical guidelines.

### Search strategy

A search strategy will be developed with the medical librarian and a clinical expert in the area of OCC (JG). The following terms will be used to search in different databases: ‘cancer, neoplasm/oral, mouth/head, neck, buccal, lips/tongue/assess, screen, inspect and exam’. The terms will be followed by appropriate truncation symbols for example (\* or \$). For further refinement Boolean operators such as (AND/OR? proximity) will be used. The search will be limited to titles/abstracts rather than full bibliographic records.

The search results in MEDLINE and EMBASE will be limited to systematic reviews, using the SIGN search filter, or clinical guidelines, using Texas School of Public Health search filter.<sup>23</sup> These search filters are pretested strategies that identify the higher quality evidence which are indexed in the major medical databases. Online Appendix 4 includes a sample of search strategy in MEDLINE.

### Data management

All the search results including bibliographies, citation and references will be managed through a reference manager ‘Endnote’. The collected records (systematic reviews and clinical guidelines) will be evaluated independently by two investigators from the research team (NMB, LMDM, JG, HW-A and DIC). The evaluation will include reviewing titles, abstracts and full text of articles. Duplicate records will be removed. A PRISMA four-phase flow diagram will be designed to indicate the search process. The diagram will map out information about the number of records identified in the literature searches based on inclusion criteria, number of studies included and excluded and the reasons for exclusion. The final selected systematic reviews and clinical guidelines will be assessed for quality and risk of bias. Any discrepancies between the investigators will be resolved by consensus. This stage will be adapted from Cochrane Collaboration.<sup>24</sup>

### Data extraction

The Cochrane Collaboration data collection form will be adopted, modified and pilot tested to meet study specified requirements.<sup>24</sup> The piloted data extraction form will be used independently by two investigators from our review team. The following information will be extracted from the included systematic reviews and clinical guidelines: authors/organization (e.g. Cochrane, ADA), date of publication, funding source(s), number/type of studies included, type of synthesis, population (e.g. age group, gender), time period, interventions, comparison (vs. no screening, or comparison in high-risk group), outcomes, main results and conclusions – including recommendations which will include the level of evidence used within the systematic review and clinical guidelines. A sample data extraction form for the systematic review is included in Online Appendix 5. A similar form will be used to extract the data from the clinical guidelines (Online Appendix 6). Any

missing information from the reports will be recorded as ‘not described’ in the data extraction forms. Discrepancies will be resolved through discussion by the review team.

### Quality assessment and risk of bias

**Systematic reviews.** The methodological quality and the risk of bias of the included systematic reviews will be assessed by two reviewer using two different tools: AMSTAR<sup>25</sup> and ROBIS tool.<sup>26</sup> The AMSTAR tool is a valid and reliable tool.<sup>27</sup> It consists of 11 items assessing quality of the key stages of systematic reviews.<sup>25</sup> The recently developed ROBIS<sup>26</sup> tool is completed in three phases to (1) assess relevance (optional);, (2) identify concerns across four domains of systematic reviews – study eligibility criteria, identification and selection of studies, data collection and study appraisal and synthesis and findings – with the review process and (3) judge risk of bias. The outputs of the AMSTAR and ROBIS tools will be compared, and the items/domain which focused on quality appraisal will be prioritized in data synthesis.

**Clinical guidelines.** The quality of the clinical guidelines will be assessed by two reviewers using the AGREE II instrument.<sup>28</sup> This tool consists of 23 key items organized within six domains followed by two global rating items (‘overall assessment’). Each capturing a unique dimension of quality, followed by an overall quality assessment score.

### Data synthesis

Initially, we will establish two separate lists of clinical guidelines and systematic reviews as independent categories. Each category will be synthesized separately according to the Centre for Reviews and Dissemination guidance for undertaking systematic reviews.<sup>29</sup> We will focus the synthesis on the following themes: description of the clinical examination; frequency of the assessment; use of adjunct methods and whether the approach should be population, opportunistic or targeted based on risk factors. Analysis between and within the themes will follow the thematic description, along with assessing the strength of the evidence and recommendations.<sup>30,31</sup> In addition to the thematic structure, the quality of the systematic reviews/clinical guideline along with time/recency of publication will take primacy in the synthesis of recommendations.

### Overview of clinical guidelines and systematic reviews

Following the data synthesis of the two categories, we will be able to evaluate the relationship between clinical guidelines and the evidence base available from systematic reviews (i.e. to assess if the clinical guidelines reflect the evidence base from the systematic reviews or if there are gaps in the evidence).

We are certain that this innovative method, also being implemented in a similar study,<sup>20</sup> will add to the existing body of knowledge and provide dental health professionals with the best evidence-based method for early detection/screening for

OCC and potentially malignant disorders in the primary health-care settings. The synthesized evidence will be used to make recommendations for OCC early detection/screening processes for the dental healthcare professionals.

This protocol is the first step in undertaking a systematic review of the best evidence and guidelines in relation to the early detection of oral cancer. It sets out the methods for undertaking a systematically search, quality appraisal and synthesis of the evidence from published systematic reviews and clinical guidelines to inform dental healthcare professionals in relation to the early detection/screening for OCC. It will assist in the process of identifying potential gaps in the extent of systematic reviews and the clinical guidelines – including how well clinical guidelines reflect the systematic review literature. The end point of this systematic review aims to support dental professionals, researchers, policymakers and guideline developers by providing high-quality evidence on interventions that will improve clinical practice and patient care. The findings will inform the development of an early detection/screening oral cancer intervention.

### Dissemination of findings

We will report the findings of the review using the PRISMA statement.<sup>32</sup> We will also share the findings in a peer review journal, communicate the findings with professional bodies and policymakers and participate in scientific meetings and national and international conferences. The findings will also be submitted as part of a PhD degree.

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### Authors' contribution

All authors were involved in the study design and conception and contributed to the drafting of the protocol.

### Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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### Supplemental material

The online appendices are available at <http://too.sagepub.com/supplemental>.

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### Translational value

This protocol is the first step in undertaking a systematic review of the best evidence and guidelines in relation to the early detection of oral cancer. It sets out the methods for undertaking a systematic search, quality appraisal and synthesis of the evidence from published systematic reviews and clinical guidelines to inform dental healthcare professionals in relation to the early detection/screening for oral cavity cancer (OCC). It will assist in the process of identifying potential gaps in the extent of systematic reviews and in the clinical guidelines – including how well clinical guidelines reflect the systematic review literature. The end point of this systematic overview aims to support dental professionals, researchers, policymakers and guideline developers by providing high-quality evidence on interventions that will improve clinical practice and patient care. The findings will inform the development of an early detection/screening oral cancer intervention.