Oral, Head and Neck Examination Practices of Nova Scotia Dental Hygienists

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Research Advisor: Cara Tax
INTRODUCTION

In 2013, 4,150 new cases of oral cancer were diagnosed in Canada. Approximately 130 cases were in Nova Scotia.¹

Canadian Cancer Statistics estimates 26% of Nova Scotians diagnosed with oral cancer in 2013, will die.²

Almost 2/3s of oral cancer patients are diagnosed in late stages when tumors are large and have spread to lymph nodes.³

Early detection can significantly decrease the debilitating effects of oral cancer treatments and increase survival rates.²
The Cochrane Review:

- Technologies to treat and manage oral cancer have progressed substantially. Traditional treatment includes surgery and radiotherapy and more recently systemic chemotherapy.\(^4\)

- The five-year survival following diagnosis has remained around 50% for the past 30 years in most countries.\(^4\)

- This is in marked contrast to other cancer where survival rates have improved (breast and colon).\(^4\)

- May be explained in part to the fact that oral cancer is more often diagnosed at a late stage of the disease when prognosis is poorer and risks of morbidity and mortality are higher.\(^4\)
The Cochrane Review concludes that oral cancer incidence and mortality can be reduced using 3 approaches:

- **Primary Prevention**
- **Secondary prevention, screening and early detection**
- **Improved treatment**
WHY CONDUCT THIS RESEARCH?

- SAVING LIVES IS IMPORTANT!

- Research shows that dental hygienists are facing barriers when it comes to performing head and neck examinations.\(^3,4\)

- Therefore it would be helpful to have a “big picture” of what is happening out in practice.

- This study is, in part, a follow up to a study that was conducted by Dr. Joanne Clovis et al. in 1998.\(^4\) It’s useful to see if there have been any improvements in the knowledge and practices since that time.
PURPOSE
Purpose of the Research

PURPOSE STATEMENT

To explore current Nova Scotia dental hygienists practices of the oral, head and neck examinations and to explore the barriers preventing them from conducting the examination.

RESEARCH QUESTION

Are dental hygienists in Nova Scotia routinely performing oral, head and neck examinations, as taught by accredited schools?
METHODS
METHODS

- ETHICS
  - Institutional ethics approval from the Health Sciences Research Ethics Board in January 2014

- RESEARCH DESIGN
  - Descriptive cross sectional survey
  - Quantitative study

- TARGET POPULATION
  - Every licensed dental hygienist in Nova Scotia
METHODS

• RECRUITMENT METHODS
  • Email invitation to an online survey sent out to 670 practicing Nova Scotia dental hygienists through CDHNS
  • Two reminder emails sent out at one week intervals

• SAMPLING METHODOLOGY
  • In order to achieve a confidence level of 95% and a margin of error of 5% we needed 244 hygienists to respond.
  • Target sample size = 244
METHODS

• DATA COLLECTION METHODS
  • Opinio© online survey software used
    • Hosted on secure Dalhousie server

• CATEGORIES
  • Frequency of examinations
  • Steps of the examinations
  • Barriers
  • Demographic information
METHODS

DATA ANALYSIS METHODS

- SPSS software
  - Descriptive and comparative analyses
SURVEY INSTRUMENT

Oral, Head and Neck Examination Practices of Nova Scotia Dental Hygienists

INTRA AND EXTRA ORAL, HEAD AND NECK EXAMINATIONS

How often do you perform an intra/extra oral exam at the initial appointment?

Never  Rarely  Sometimes  Usually  Always

What patient factors would prompt you to perform an intra and extra oral, head and neck examination at the INITIAL appointment?

☐ Known tobacco user
☐ Known heavy alcohol user
☐ Known history of cancer
☐ Known history of HPV
☐ Age
☐ Known unhealthy eating (e.g. Low consumption of fruits and vegetables)
☐ Other: __________
### Oral, Head and Neck Examination Practices of Nova Scotia Dental Hygienists

#### EXTRA ORAL EXAM - When performing an extra oral exam, do you:

<table>
<thead>
<tr>
<th>Question</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Usually</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visually inspect the integrity of skin, eyes and lips?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palpate the lymph nodes of the head and neck region?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Palpate the salivary glands?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Palpate the TMJ upon opening and closing of the jaw?</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
### Oral, Head and Neck Examination Practices of Nova Scotia Dental Hygienists

**INTRA ORAL EXAM - When performing an intra oral exam, do you:**

<table>
<thead>
<tr>
<th>Visually inspect the lips and vermillion border?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
</tr>
<tr>
<td>Ø</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Palpate the tongue?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
</tr>
<tr>
<td>Ø</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Visually inspect the oral cavity?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
</tr>
<tr>
<td>Ø</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Palpate the lips and cheeks?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Never</td>
</tr>
<tr>
<td>Ø</td>
</tr>
</tbody>
</table>
SURVEY INSTRUMENT

Oral, Head and Neck Examination Practices of Nova Scotia Dental Hygienists

When was the last time you attended a continuing education course pertaining to intra and extra oral, head and neck examinations and/or oral cancer?

- Never
- I am a new graduate
- More than 5 years ago
- Within the past 2-5 years
- Within the past 12 months

Are you interested in attending continuing educational courses on oral cancer in the future?

- Yes
- No

Have you ever identified a suspicious finding in the head and neck region?

- Yes
- No
# Oral, Head and Neck Examination Practices of Nova Scotia Dental Hygienists

## Demographic Information and Practice Setting

**From what dental hygiene institute did you graduate?** (Please state if other)

- [ ] APLUS Institute

**How would you rate your dental hygiene knowledge/skill regarding intra and extra oral, head and neck examinations?**

- [ ] Very good
- [ ] Good
- [ ] Poor
- [ ] Very poor
- [ ] Not sure

**What year did you graduate from your dental hygiene program?**

- [ ] 1960 - 1969
- [ ] 1970 - 1979
- [ ] 1980 - 1989
- [ ] 1990 - 1999
- [ ] 2000 - 2013

**How many years have you been a practicing hygienist?**

- [ ] 1
RESULTS
NUMBER OF PARTICIPANTS

- Population of CDHNS: 670
- Target sample size: 244
- N achieved: 212
- Response rate: 32%
DEMOGRAPHIC INFORMATION

Institute of Graduation

<table>
<thead>
<tr>
<th>Dental Hygiene Institute</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dalhousie</td>
<td>81.1%</td>
</tr>
<tr>
<td>APLUS</td>
<td>7.1%</td>
</tr>
<tr>
<td>Algonquin</td>
<td>3.8%</td>
</tr>
<tr>
<td>Oulton</td>
<td>2.8%</td>
</tr>
<tr>
<td>U of Manitoba</td>
<td>1.4%</td>
</tr>
<tr>
<td>Other</td>
<td>3.8%</td>
</tr>
</tbody>
</table>
DEMOGRAPHIC INFORMATION

Year of Graduation

<table>
<thead>
<tr>
<th>Years</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970-1979</td>
<td>9.5%</td>
</tr>
<tr>
<td>1980-1989</td>
<td>19%</td>
</tr>
<tr>
<td>1990-1999</td>
<td>21.4%</td>
</tr>
<tr>
<td>2000-2013</td>
<td>50%</td>
</tr>
</tbody>
</table>
DEMOGRAPHIC INFORMATION

Years of Practice

Range: 1-44 years
Mean±SD: 15.90±11.5

- 42.5% for 1 thru 10 years
- 22.6% for 11 thru 20 years
- 24.5% for 21 thru 30 years
- 9.4% for 31 thru 40 years
- 0.9% for 41 thru 50 years
DEMOGRAPHIC INFORMATION

Type of Employment

<table>
<thead>
<tr>
<th>Type of Practice</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Practice</td>
<td>83.5%</td>
</tr>
<tr>
<td>Independent</td>
<td>2.4%</td>
</tr>
<tr>
<td>Public Health/Gov Specialty</td>
<td>4.2%</td>
</tr>
<tr>
<td>Specialty Practice</td>
<td>9%</td>
</tr>
<tr>
<td>Hospital</td>
<td>0.5%</td>
</tr>
<tr>
<td>DH Education</td>
<td>6.1%</td>
</tr>
<tr>
<td>Other</td>
<td>4.2%</td>
</tr>
</tbody>
</table>
Current work status

- Permanent FT: 67%
- Permanent PT: 22.6%
- Casual: 7.5%
- Unemployed: 3.3%
SKILLS AND KNOWLEDGE

Personal rating of one's own knowledge/skill regarding intra and extra oral, head and neck examinations

- Very Good: 43.1%
- Good: 48.8%
- Not Sure: 3.3%
- Poor: 4.3%
- Very Poor: 0.5%
FREQUENCY OF PERFORMANCE

Frequency of oral, head and neck exam at INITIAL appointment

- **Never**: 7.2%
- **Rarely**: 13.9%
- **Sometimes**: 22.6%
- **Usually**: 20.7%
- **Always**: 35.6%
INITIAL APPOINTMENT

Performance of exam at initial appointment

- Always performing exam at initial appointment: 65%
- Not always performing exam at initial appointment: 35%
Patient factors prompting performance of intra and extra oral, head and neck examination at the INITIAL appointment

- **Known Smoking Tobacco User**: 58%
- **Known Chewing Tobacco User**: 58.5%
- **Known Heavy Alcohol User**: 39.6%
- **Known History of Cancer**: 56.6%
- **Known History of HPV**: 31.1%
- **Age**: 35.8%
- **Known Unhealthy Eating**: 12.3%
- **Other**: 25%
Patient age prompting performance of an intra and extra oral, head and neck examination at the INITIAL appointment.
Frequency of performing the intra and extra oral, head and neck examinations at RECALL appointments

- Never: 8.3%
- Rarely: 16%
- Sometimes: 31.6%
- Usually: 24.3%
- Always: 19.9%
RECALL APPOINTMENT

Performance of exam at recall appointment

- Always performing exam at recall appointment: 81%
- Not always performing exam at recall appointment: 19%
Patient factors prompting performance an intra/extra oral exam at RECALL appointments:

- Known Smoking Tobacco User: 61.8%
- Known Chewing Tobacco User: 59.9%
- Known Heavy Alcohol User: 45.3%
- Known History of Cancer: 65.6%
- Known History of HPV: 33.5%
- Known Unhealthy Eating: 37.7%
- Age: 12.7%
- Other: 19.8%
Patient age prompting performance of an intra and extra oral, head and neck examination at the RECALL appointment.

- <18: 11.8%
- 19-39: 29.7%
- 40-64: 33.5%
- 65+: 32.1%
Recall intervals at which exams are performed

- 4 Month Interval: 2%
- 6 Month Interval: 40.7%
- 12 Month Interval: 34.8%
- Other: 22.1%
SELF EXAMINATION

Provision of instruction for self examination

- Never: 26.3%
- Rarely: 38%
- Sometimes: 28.3%
- Usually: 4.9%
- Always: 2.4%
When performing an extra oral exam, do you:

- **Check thyroid glands**
- **Palpate TMJ**
- **Palpate salivary glands**
- **Palpate the lymph nodes of head and neck**
- **Visually inspect skin, eyes, lips**

Percentage (%)

- **Always**
- **Usually**
- **Sometimes**
- **Rarely**
- **Never**
Extra oral exam performance

- Comprehensive: 87%
- Partial: 13%
INTRAORAL PERFORMANCE

When performing an intra oral exam, do you?

- Inspect palate
- Inspect tonsils
- Check salivary gland function
- Palpate floor of mouth
- Palpate lips and cheeks
- Visual inspect oral cavity
- Palpate tongue
- Visual inspect lips

Percentage (%)

- Always
- Usually
- Sometimes
- Rarely
- Never
INTRAORAL PERFORMANCE

Intra oral exam performance

- Comprehensive: 93%
- Partial: 7%
Performance of exam at initial and recall appointments

Initial:
Chi-square=5.99
df=3
p=0.112

Recall:
Chi-square=4.49
df=3
p=.213

- Always do exam at initial appointment
- Always do exam at recall appointment

Year of graduation:
- 2000-2013
- 1990-1999
- 1980-1989
- 1970-1979

Percentage (%):
- 28.6%
- 37.8%
- 40%
- 55%
COMPARATIVE ANALYSES

Comprehensive performance of intraoral and extraoral exams

**Table:**
- **Intra:**
  - Chi square = 12.75
  - df = 3
  - P < .01
- **Extra:**
  - Chi-square = 7.12
  - df = 3
  - P = 0.07

**Graph:**
- Percentage (%)
  - 0, 20, 40, 60, 80, 100

- Comprehensive intraoral
- Comprehensive extraoral
Logistic Regression Analyses

**Dependent variable:** Comprehensive intra oral exam

**Independent variables:** institute attended AND decade of graduation

Overall regression model p value = 0.014

**Decade of graduation** was a significant predictor of performing a perfect intraoral exam \( (p=0.018) \)

Respondents who graduated in the decade **1970-79** were **11.3** times more likely to conduct a COMPREHENSIVE intra oral exam than respondents who graduated in **2000-2013**.
### Barriers to performing intra and extra oral, head and neck examinations routinely

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dentist performs the exam</td>
<td>47.6%</td>
</tr>
<tr>
<td>Lack of knowledge and/or skills</td>
<td>4.2%</td>
</tr>
<tr>
<td>Concern about patient compliance</td>
<td>55.2%</td>
</tr>
<tr>
<td>Concern over remuneration</td>
<td>14.6%</td>
</tr>
<tr>
<td>Unsure of DH scope of practice</td>
<td>2.8%</td>
</tr>
<tr>
<td>Not necessary/not needed</td>
<td>0.5%</td>
</tr>
<tr>
<td>Unsubstantiated by research</td>
<td>3.3%</td>
</tr>
<tr>
<td>My employer does not allow it</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>10.4%</td>
</tr>
</tbody>
</table>
The BIGGEST barrier to performing intra and extra oral, head and neck examinations routinely

<table>
<thead>
<tr>
<th>Barriers</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dentist performs the exam</td>
<td>21.6%</td>
</tr>
<tr>
<td>Lack of knowledge and/or skills</td>
<td>3.8%</td>
</tr>
<tr>
<td>Lack of time</td>
<td>45.3%</td>
</tr>
<tr>
<td>Patient compliance concern</td>
<td>7.1%</td>
</tr>
<tr>
<td>Unsure of DH scope of practice</td>
<td>0.9%</td>
</tr>
<tr>
<td>Not necessary/not needed</td>
<td>0%</td>
</tr>
<tr>
<td>Unsubstantiated by research</td>
<td>0.9%</td>
</tr>
<tr>
<td>Employer does not allow it</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>5.7%</td>
</tr>
</tbody>
</table>

The BIGGEST obstacle to performing intra and extra oral, head and neck examinations routinely is lack of time, with 45.3% of respondents identifying this as the biggest barrier.
CONTINUING EDUCATION

Last oral cancer continuing education course

<table>
<thead>
<tr>
<th>Time</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Graduate</td>
<td>9.5%</td>
</tr>
<tr>
<td>Within past 12 months</td>
<td>11.4%</td>
</tr>
<tr>
<td>Within past 2-5 years</td>
<td>30.5%</td>
</tr>
<tr>
<td>More than 5 years</td>
<td>27.1%</td>
</tr>
<tr>
<td>Never</td>
<td>21.4%</td>
</tr>
</tbody>
</table>
Are you interested in attending continuing education courses on oral cancer in the future?

- No
- Yes

- 99%
- 1%
IDENTIFICATION OF SUSPICIOUS FINDING

Have you ever identified a suspicious finding in the head and neck region?

- No: 84%
- Yes: 16%
Have you ever directly or indirectly referred a patient for biopsy/diagnosis of a suspicious finding?

- No 94%
- Yes 4%
- Not sure 2%
QUALITATIVE THEMES

1) Respondents agree on the importance of the examination

- “I think whatever can be done to encourage more exams is helpful.”

- “I believe it is a valuable service we offer our patients.”

- “Performing head and neck exams is mandatory in my office and I also feel that it is an important practice.”
QUALITATIVE THEMES

2) Exams are not being done

- “Rarely do I see my dentist do this exam and my hygienists never do one on me.”
- “I am the only hygienist [in my office] who takes the time to do an intra oral exam.”
- “I feel this isn't being performed often enough or routinely enough.”
- “In my dental office the dentist is supposed to, not sure if they are.”
3) **Respondents offer suggestions**

- “To save time maybe this exam could be done in a private screening area while patients are waiting for their recare appointment.”
DISCUSSION & CONCLUSION
KEY QUESTIONS:

1. Are Dental Hygienists performing examinations routinely?

2. Are Dental Hygienists performing a comprehensive examination as taught by accredited institutions?

3. If not performing the examination, what are the barriers?
1) Routine performance

35.6% of dental hygienists report always performing the exam at the INITIAL appointment.

- 20.7% of DHs report usually performing the exam

19.9% of dental hygienists report always performing the exam at the RECALL appointment.

- 24.3% of DHs report usually performing the exam
2) **Comprehensive Exams**

7% of dental hygienists report performing a **COMPREHENSIVE** intraoral examination

13% of dental hygienists report performing a **COMPREHENSIVE** extra oral examination

<table>
<thead>
<tr>
<th>Intra Oral</th>
<th>Extra Oral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspect palate</td>
<td>Check thyroid gland</td>
</tr>
<tr>
<td>Inspect tonsils</td>
<td>Palpate TMJ</td>
</tr>
<tr>
<td>Check salivary gland function</td>
<td>Palpate salivary glands</td>
</tr>
<tr>
<td>Palpate the floor of the mouth</td>
<td>Palpate the lymph nodes of the head and neck</td>
</tr>
<tr>
<td>Palpate lips and cheeks</td>
<td>Visually inspect skin, eyes and lips</td>
</tr>
<tr>
<td>Visually inspect oral cavity</td>
<td></td>
</tr>
<tr>
<td>Palpate tongue</td>
<td></td>
</tr>
<tr>
<td>Visually inspect lips</td>
<td></td>
</tr>
</tbody>
</table>

• **91.9%** of dental hygienists rated their personal knowledge or skill regarding the exam as good to very good.
3) Barriers

Top three barriers to performing exam:

Lack of time *(45.2%)*

Dentists performs the exam *(21.6%)*

Lack of patient compliance *(7.1%)*
FACTORS PROMPTING EXAM

2014 STUDY:

• Tobacco use
• Known history of cancer
• Known alcohol use

1998 STUDY:

• Patient’s history of cancer
• Patient’s tobacco use
• Patient’s alcohol use
SELF PERCEIVED SKILLS

Personal rating of one's own knowledge/Skill

Personal Rating of Good-Very Good

Frequency (%)
PERFORMANCE IMPROVEMENT

DH's Palpation of Lymph Nodes

<table>
<thead>
<tr>
<th>Year of study</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>10</td>
</tr>
<tr>
<td>2014</td>
<td>80</td>
</tr>
</tbody>
</table>
BARRIERS

Biggest Barrier to Performing Exam

- Lack of time
- Dentist provides
- Patient compliance
- Not trained

Frequency (%)

Barriers

1998
2014
Significant Findings

Respondents who graduated in the decade 1970-1979 were 11.3 times more likely to conduct a COMPREHENSIVE intra oral exam than respondents who graduated in 2000-2013.

- Decade of graduation was a significant predictor of performing a perfect intraoral exam (p=0.018).
LIMITATIONS OF THE STUDY

INTERNAL VALIDITY:
• Recall bias

EXTERNAL VALIDITY:
• Respondents may have a greater knowledge or interest than non-respondents.
• Individual’s ability to complete an online survey
Conclusions

- Dental hygienists believe that these examinations are an integral part of their patient care
  - But, only **35%** are always performing some portion the exam at the initial appointment and
  - **19%** are always performing some portion of the exam at recall appointments

- Results indicate that Nova Scotia dental hygienists need more time to perform exam

- Participants indicate that more CE courses should be offered

- Dental hygienists who have been practicing longer are performing comprehensive examinations more frequently than others
Our Responsibility

Dental hygienists are in an ideal position to perform oral cancer screening.

Dental hygienists are well trained to perform intra and extra oral examinations.

Dental hygienists have an ethical responsibility to conduct comprehensive intra and extra oral examinations.

Interprofessional health collaboration is also a professional responsibility.
Clinical Pathway

Standard process of screening for oral cancer is by a systematic and thorough visual inspection of the oral mucosa and palpation of the neck.

Should be carried out by frontline clinicians as a part of routine recall examinations.

COE is followed by referral for further investigation if this is deemed necessary.

Dental hygienists have a professional responsibility to refer any suspicious lesion or abnormal tissue condition that persists over 3 weeks in duration.
RECOMMENDATIONS

Review office policy
  • Discuss office protocols for intra/extra oral examinations
  • Clarify responsibilities for examinations
  • Review referral pathways

Educate other dental professionals on the scope of practice of dental hygienists.
RECOMENDATIONS

Further Research:

- Use this study as a pilot project and compare Nova Scotia to other Canadian provinces

- Survey dentists with the same instrument
ACKNOWLEDGEMENTS

Dr. Martha Smith-Brillant
  • Research Development Officer

Patricia Grant
  • Registrar, College of Dental Hygienists of Nova Scotia

Professor Cara Tax
  • Research Supervisor

Dr. Joanne Clovis
  • Collaborator