



OPEN ACCESS

Oral candidiasis in a specialist palliative care unit: assessment, diagnosis, management

Sarah Bishop Browne ^{1b},^{1,2} Tanya Munn,¹ Anna Cheng,^{3,4}
Jessica Tsuann Lee ^{1b}^{1,5}

¹Palliative Care, Concord Repatriation General Hospital, Concord, New South Wales, Australia

²Palliative and Supportive Care, Chris O'Brien Lifehouse, Camperdown, New South Wales, Australia

³Oral Health, Concord Repatriation General Hospital, Concord, New South Wales, Australia

⁴Oral Health Promotion, Sydney Dental Hospital, Surry Hills, New South Wales, Australia

⁵University of Technology Sydney, Broadway, New South Wales, Australia

Correspondence to

Dr Sarah Bishop Browne, Palliative Care, Concord Repatriation General Hospital, Concord, NSW 2139, Australia; sarahbrowne@gmail.com

This report was awarded the Australian and New Zealand Society of Palliative Medicine prize for Best Trainee Research Project for 2022. A summary of the findings was presented at the Oceanic Palliative Care Conference, September 2021.

Received 20 February 2023

Accepted 8 March 2023



© Author(s) (or their employer(s)) 2023. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Bishop Browne S, Munn T, Cheng A, et al. *BMJ Supportive & Palliative Care* Epub ahead of print: [please include Day Month Year]. doi:10.1136/spcare-2023-004237

ABSTRACT

Objectives To evaluate current clinical practices of assessment, diagnosis and management of oral candidiasis in a specialist palliative care unit to improve patient outcomes through compliance with the Australian Commission on Safety and Quality in Health Care Antimicrobial Stewardship Clinical Care Standard.

Methods A clinical audit cycle: review of 100 patient records preceded an educational intervention delivered over 4 weeks to clinical stakeholders, followed by a review of an additional 100 records.

Results Eleven patients in each cohort had oral candidiasis. A statistically significant improvement in documented rates of oral examination (33% to 51%, $p=0.015$) and appropriate microbiological testing (0% to 63.6%, $p=0.004$) was achieved. Documentation of oral symptoms and prescribing practices were unchanged.

Conclusions Meaningful changes in practice relating to oral assessment and diagnosis of oral candidiasis are possible. Future iterations of the audit cycle may benefit from multimodal interventions to encourage further practice change.

BACKGROUND

Oral health impinges on patients' quality of life during palliative care,¹ while oral symptoms go under-reported, under-diagnosed and undertreated.¹⁻³ Assessment tools do not generally specify oral symptoms,⁴ yet *Candida* is prevalent in advanced illness.⁵ Antimicrobial stewardship (AMS) aims to optimise antimicrobial use.

The Hospital National Antimicrobial Prescribing Survey (NAPS), a standardised auditing tool, enables national benchmarking of the quality of antimicrobial prescribing,⁶ informed by the Australian Commission on Safety and Quality in

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Oral problems are common in palliative care patients and contribute to poor quality of life. Antimicrobial stewardship programmes aim to optimise antimicrobial use, minimise harm and reduce resistance. Oral candidiasis has characteristic features on history and examination but no guidelines exist to guide diagnosis in practice.

WHAT THIS STUDY ADDS

⇒ We describe a completed audit cycle to improve quality of assessment and management of oral candidiasis in patient cohorts admitted to a specialist palliative care unit. We found that the symptoms of oral candidiasis may be poorly recognised and microbiological testing to improve accuracy of clinical diagnosis can avoid unnecessary treatment.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ This audit cycle provides preliminary data which could inform an implementation study such as a prospective, multicentre trial to determine the best way of embedding evidence-based practice in assessment and management of oral candidiasis.

Health Care (ACSQHC) AMS Clinical Care Standard.⁷ NAPS criteria stipulate >95% of antimicrobial prescriptions adhere to evidence-based guidelines, document treatment indications and duration or timing of review.⁶ The Australian Therapeutic Guidelines: Palliative Care recommends nystatin as first-line treatment for oral candidiasis.⁸

A NAPS at Concord Repatriation General Hospital (CRGH) 2015–2018 identified nystatin as the most frequently prescribed antimicrobial. In 2018, 100% of surveyed nystatin prescriptions at

Clinical audit

CRGH included documentation of indication for treatment; however, only 33.3% included a review or stop date.

Aim

To evaluate current clinical practices of assessment, diagnosis and management of oral candidiasis in a specialist palliative care unit.

Setting

The Concord Centre for Palliative Care (CCPC), a 20-bed inpatient unit attached to CRGH, delivers multidisciplinary care to patients with complex needs.

METHODS

Study design: clinical audit. Identifying discrepancies between measured performance and standards enables formulation of strategic action plans to effect practice changes.⁹

Primary objective

1. One hundred per cent of patients admitted to CCPC have a comprehensive oral assessment, which included documented history and examination within 72 hours of admission (source of evidence: National Palliative Care Standards¹⁰).

Secondary objectives

2. Ninety-five per cent of prescriptions for oral candidiasis should comply with AMS Clinical Care Standards documentation:
 - a. Indication for therapy.
 - b. Duration of treatment and stop/review date (source of evidence: National Centre for Antimicrobial Stewardship⁶).
3. Thirty per cent microbiological testing to support accurate diagnosis except with convincing features on history and examination (source of evidence: research articles^{11 12}).

Study procedures

Baseline audit: 100 consecutive patients admitted to CCPC (April–July 2019). A 4-week educational intervention followed. Second audit: 100 consecutive patients admitted to CCPC from August to October 2019.

Educational intervention

A trainee in palliative medicine (SBB) and a dentist presented the baseline audit results and specific education to clinical staff, addressing assessment, diagnosis and treatment of oral candidiasis, and the ACSQHC AMS Clinical Care Standard particularly microbiological testing, use of guidelines and documentation.¹³

Study population

All patients admitted to CCPC during the audit period were eligible for inclusion.

Table 1 Overall findings

	Pre	Post	P value
Documentation of oral assessment within 72 hours of admission—history and examination			
History	6%	2%	0.279
Examination	33%	51%	0.015*
Diagnosis of oral candidiasis and investigational swab			
Diagnosis	11%	11%	1.000
Investigational swab	0%	63.6%	0.004*
Prescription of antifungal therapy—compliance with national antimicrobial stewardship standards			
Indication	100%	95%	1.000
Duration	6.3%	5%	1.000
Stop/review date	6.3%	5%	1.000

* indicates statistically significant results ($p < 0.02$)

Data collection and security

Deidentified data from electronic medical records (demographics, primary diagnosis and admission medications) were entered into a secure application for research studies.

Analysis

Data were obtained from 100 patients before, and 100 after, the education intervention with descriptive statistics (frequencies, means, ranges and SDs). Comparisons between cohorts were analysed by a X^2 or a Fisher's exact test (when the assumptions of a X^2 test are not met). A p value of < 0.05 indicated a statistically significant difference.

Outcomes

Fifty-three per cent of patients were on at least one medication which predisposed to oral candidiasis at presentation, most commonly an oral or parenteral corticosteroid (38.5%). On admission, 28 were already taking an antifungal medication. Overall findings are summarised in table 1.

Oral assessment: history and physical examination

A statistically significant improvement in documentation of oral examination during the audit cycle went from 33% to 51% ($p = 0.015$). The most frequently recorded finding, coating of the tongue, was documented in 9% before and 13% of cases after the intervention. Documentation of oral history was sparse, 6% before and 2% after, with the most common specifiers being 'sore mouth' and 'altered oral sensation'.

Oral candidiasis: diagnosis and investigation

In the initial cohort, 11 patients had a clinical diagnosis of oral candidiasis. None underwent confirmatory investigation with microscopy and culture. Two patients, clinically diagnosed with candidiasis, did not receive antifungal therapy.

After the educational intervention, oral candidiasis was diagnosed in 11 patients through history and

examination. Seven had laboratory testing, a statistically significant increase in rates of microbiological investigation post-intervention ($p=0.004$). *Candida* spp were detected on three of the seven swabs. One patient with a positive microscopy/culture result did not receive antifungal therapy and three, with clinical features of candidiasis but negative swab results, avoided antifungal treatment. One continued on antifungal therapy despite a negative microscopy/culture result.

AMS and compliance with national standards

Nystatin was the only antifungal prescribed for newly diagnosed oral candidiasis in both cohorts. At baseline, indication for therapy was documented for all prescriptions. Only one prescription detailed treatment duration. A stop/review date was documented for one patient.

Indications were documented for 95% of antifungal prescriptions in the second cohort. The single non-compliant prescription included 'usual medication' as the indication. Five per cent of prescriptions specified duration of treatment and review date.

CONCLUSIONS

We examined practices about assessment, diagnosis and management of oral candidiasis in a palliative care patient population. Prescribing practices were compared against therapeutic guidelines⁸ and national AMS standards.⁷

A statistically significant improvement in documented rates of physical examination showed during the audit cycle, but no improvement in documentation of oral symptoms. The educational intervention emphasised examination technique, differential diagnoses and microbiological testing for confirming or excluding oral candidiasis. Future educational interventions may benefit from highlighting history features. Assessment and intervention may occur but not be recorded,¹⁴ so repeating this audit cycle may further improve compliance with standards and improve practice.

Eleven per cent of patients in both cohorts were diagnosed with oral candidiasis, considerably less than the reported prevalence of >30%.^{11 15} This suggests underdiagnosis and treatment. Alternatively, the rate of oral candidiasis may have been accurate. Statistically significant improvement in rates of microbiological testing to support clinical diagnosis showed during the audit cycle. No guideline exists for testing in this context; however, the ACSQHC AMS Clinical Care Standard encourages clinicians to 'obtain appropriate samples for microbiology testing when clinically indicated and before starting antimicrobial therapy whenever possible'.⁷ Microscopy, with or without culture tests, is widely available and relatively inexpensive. Judicious testing to improve sensitivity and specificity of clinical diagnosis may enable patients to avoid unnecessary and burdensome treatment, as happened

with the three patients with negative swabs in this audit.

No change in prescribing practice occurred during this audit cycle, possibly due to a lack of focus on prescribing and therapy review dates, or on systemic processes. All new prescriptions for oral candidiasis complied with the Australian Therapeutic Guidelines.⁸ The electronic prescribing system at CRGH necessitates inclusion of an indication, potentially accounting for the high rates of concordance. Inclusion of stop date or therapy duration is optional, so an automated prompt to review investigation results and need for ongoing therapy may encourage clinicians to review oral symptoms.

To achieve successful change, healthcare professionals require: opportunity to influence the change, preparedness for the change and recognition of its value, particularly patient benefit.¹⁶ System processes, for example, standardisation of an admission template to include oral assessment, may cause change. Incorporation of oral assessment as a quality indicator at multidisciplinary team meetings may reinforce the importance of oral health. Future iterations of the audit cycle may benefit from surveys of education participants pre-intervention and post-intervention to assess key concepts. A multimodal approach to education could include posters/written materials in the clinical environment and/or reminders at clinical meetings. This audit cycle could inform a prospective, multicentre trial to determine ways of best embedding evidence-based practice in assessment and management of oral candidiasis.

Strengths of this study included consecutive sampling with no exclusion criteria, which limited the risk of sampling bias. Approval by the local Ethics Committee ensured research standards. Data were complete, which improved confidence in reliability. A dentist with specific interest in palliative care and development and delivery of the education intervention further strengthened the study.

Limitations included the retrospective design so that outcomes reflect documentation of practice, not actual practice. The sample size was small, particularly in reference to the absolute numbers of oral candidiasis cases diagnosed and swabs performed. Education was relied upon as the only intervention.

Oral health is vital to holistic palliative care; better documented oral examination and rates of microbiological testing to support clinical diagnoses across this audit cycle reflected meaningful changes in practice. Appropriate AMS optimises antimicrobial use.

Acknowledgements Dr Jenny Browne for editing the manuscript in preparation for submission.

Contributors JTL conceived the idea for the project. SBB and JTL designed the project. SBB and AC designed and delivered the educational intervention. TM and SBB collected relevant data. SBB drafted the report, while JTL, TM and AC reviewed the content and provided approval for publication.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Ethics approval This study involves human participants and was approved by the Sydney Local Health District Human Research Ethics Committee (ref CH62/6/2019-087). A waiver of requirement for consent was obtained owing to the negligible risk to patients associated with participation. No additional information beyond what was routinely collected for clinical care was required. De-identified data were directly entered into REDCap, a secure web-based application designed to support data capture for research studies.

Provenance and peer review Not commissioned; internally peer reviewed.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Sarah Bishop Browne <http://orcid.org/0000-0002-1506-0677>

Jessica Tsuann Lee <http://orcid.org/0000-0003-1570-066X>

REFERENCES

- Morgan A. Mouth care. In: MacLeod RD, Van denL, eds. *Textbook of Palliative Care*. Cham: Springer International Publishing, 2018: 1–8. Available: http://link.springer.com/10.1007/978-3-319-31738-0_37-1
- Fischer DJ, Epstein JB, Yao Y, *et al.* Oral health conditions affect functional and social activities of terminally ill cancer patients. *Support Care Cancer* 2014;22:803–10.
- Sweeney MP, Bagg J. The mouth and palliative care. *Am J Hosp Palliat Care* 2000;17:118–24.
- Australian Health Services Research Institute. Palliative care outcomes collaboration - evidence-based improvement of patient, family and carer outcomes [Palliative Care Outcomes Collaboration]. 2019. Available: <https://ahsri.uow.edu.au/pcoc/index.html>
- Alt-Epping B, Nejad RK, Jung K, *et al.* Symptoms of the oral cavity and their association with local microbiological and clinical findings -- a prospective survey in palliative care. *Support Care Cancer* 2012;20:531–7.
- National Centre for Antimicrobial Stewardship and Australian Commission on Safety and Quality in Health Care. *Antimicrobial prescribing practice in Australian hospitals: results of the 2017 hospital national antimicrobial prescribing survey*. ACSQHC, 2018.
- Australian Commission on Safety and Quality in Health Care. *Antimicrobial stewardship clinical care standard*. Sydney: ACSQHC, 2020.
- Management of specific oral problems in palliative care. In: *eTG complete*. 2019th ed. Melbourne: Therapeutic Guidelines Ltd, 2018.
- Esposito P, Dal Canton A. Clinical audit, a valuable tool to improve quality of care: general methodology and applications in nephrology. *World J Nephrol* 2014;3:249–55.
- Palliative Care Australia. National palliative care standards. 2018. Available: https://palliativecare.org.au/wp-content/uploads/dlm_uploads/2018/02/PalliativeCare-National-Standards-2018_web-3.pdf
- Wilberg P, Hjermstad MJ, Ottesen S, *et al.* Oral health is an important issue in end-of-life cancer care. *Support Care Cancer* 2012;20:3115–22.
- Bagg J, Sweeney MP, Lewis MAO, *et al.* High prevalence of non-albicans yeasts and detection of anti-fungal resistance in the oral flora of patients with advanced cancer. *Palliat Med* 2003;17:477–81.
- Australian Commission on Safety and Quality in Health Care. *Antimicrobial stewardship clinical care standard*. Sydney: ACSQHC, 2014: 24. Available: <https://www.safetyandquality.gov.au/wp-content/uploads/2014/11/Antimicrobial-Stewardship-Clinical-Care-Standard-web.pdf>
- Stewart K, Doody O, Bailey M, *et al.* Improving the quality of nursing documentation in a palliative care setting: a quality improvement initiative. *Int J Palliat Nurs* 2017;23:577–85.
- Davies AN, Brailsford SR, Beighton D. Oral candidosis in patients with advanced cancer. *Oral Oncol* 2006;42:698–702.
- Nilsen P, Seing I, Ericsson C, *et al.* Characteristics of successful changes in health care organizations: an interview study with physicians, registered nurses and assistant nurses. *BMC Health Serv Res* 2020;20:147.