STARS Education and Research Alliance

CREATING KNOWLEDGE | TRANSFORMING CARE

STARS Critically Appraised Topic (CAT) Group:

Fungal injections from incontinence-associated dermatitis (IAD)

The University Of Queensland AUSTRALIA

Metro North Health | Queensland Government

STARS Critically Appraised Topic (CAT) Group: IAD + Fungal infections

Specific Question:

What is best practice for secondary fungal infections associated with incontinence associated dermatitis (IAD)?

Clinical bottom line

We have found that there is high quality evidence informing prevention of incontinence associated dermatitis (IAD). There is mixed evidence regarding treatment of IAD, and an evidence practice gap for treating secondary fungal infections from IAD. Expert led guidelines recommend stopping to assess the effectiveness of anti-fungal treatments after two weeks in the context of secondary infections from IAD. There are quality improvement opportunities to provide resources and local guidelines to support a consistent approach to managing fungal infections secondary to IAD.

Why is this important?

Incontinence-associated dermatitis (IAD) is inflammation of the skin resulting from repeated contact with urine and/or faeces, causing pain, redness, swelling and excoriation, and can lead to complications like fungal skin infections and pressure injuries. Patients can be treated with antifungal topical treatments for long periods of time. A point prevalence hospital wide antimicrobial survey at STARS in October 2023 found that 29.4% of the antimicrobials prescribed were inappropriate. From the inappropriate category, 33% of incidents were due to inappropriate use of topical miconazole (a topical antifungal commonly prescribed for fungal infections secondary to IAD).

It is well recognised that fungal infections associated with IAD are challenging to diagnose. IAD is a complex condition with multiple factors influencing outcomes. Differential diagnoses for other conditions can be missed, and so antifungal agents are prescribed when non-pharmacological interventions appear to fail or dermatitis persists. Ongoing assessment of topical antifungal treatment is often ad hoc.

Inclusion Criteria

- Patients diagnosed with a fungal condition associated with incontinence associated dermatitis (IAD).
- Intervention is any antifungal agent.
- Relevant study types, providing high level evidence (including RCTs, systematic reviews, meta-analyses).
- Human participants
- English language

Search dates

2013-2023

CAT Lead: Natasha Roberts, Nursing Conjoint Clinical Fellow, STARS

Date CAT completed: 22/12/2023; To be reviewed DD/MM/YYYY

Type of Study

Intervention

PICOT

What is best practice for managing secondary fungal infections associated with incontinence associated dermatitis (IAD)?

	Description	Search terms
Population and Setting	Patients diagnosed with a fungal condition associated with incontinence associated dermatitis (IAD)	See search strategy
Intervention or Exposure (ie what is being tested)	Any antifungal agents, for example, miconazole, clotrimazole(canestan)	See search strategy
Comparison, if any	Other strategies	See search strategy
Outcomes of interest	Effectiveness, duration of treatment, cost, adverse events, re-infection rates, best practice for diagnosis and assessing response to treatment	See search strategy
Types of studies	RCTs, systematic reviews, meta-analysis	See search strategy

Databases Searched

PubMed, CINAHL Complete, Embase and Cochrane Library

Date of search

23 November 2023

Search Strategies (including subject headings)

As the first search for literature focusing on interventions to treat anti-fungal agents in patients with IAD (any study types) retrieved a limited number of results, also conducted a second broader search on IAD (including RCTs, systematic reviews and meta-analyses).

PubMed

***First search* - 36 results:**

(“incontinence-associated dermatitis”[tiab] OR “incontinence associated dermatitis”[tiab] OR “IAD”[tiab] OR "Urinary Incontinence"[Mesh] OR "Fecal Incontinence"[Mesh] OR “incontinence”[tiab]**) AND (**"Antifungal Agents"[Mesh] OR "Antifungal Agents" [Pharmacological Action] OR "Miconazole"[Mesh] OR “fungal”[tiab] OR “fungi”[tiab] OR “fungus”[tiab] OR “anti-fungal”[tiab] OR “antifungal”[tiab] OR “anti-fungals”[tiab] OR “antifungals”[tiab] OR “anti-mycotic”[tiab] OR “antimycotic”[tiab] OR “anti-mycotics”[tiab] OR “antimycotics”[tiab] OR “miconazole”[tiab] OR “clotrimazole”[tiab] OR “fluconazole”[tiab] OR “bifonazole”[tiab] OR “econazole”[tiab] OR “nystatin”[tiab] OR “terbinafine”[tiab] OR “fungistatic”[tiab] OR “fungistatics”[tiab] OR “fungicidal”[tiab] OR “fungicidals”[tiab]**) AND (**eng[la] OR und[la]**) NOT (**animals [mh] NOT humans [mh]**) AND** 2013:2023[dp]

***Second search* - 127 results:**

((“incontinence-associated dermatitis”[tiab] OR “incontinence associated dermatitis”[tiab] OR “IAD”[tiab]) OR (("Dermatitis"[Mesh] OR “dermatitis”[tiab]) AND ("Urinary Incontinence"[Mesh] OR "Fecal Incontinence"[Mesh] OR “incontinence”[tiab]))**) AND (**"Controlled Clinical Trials as Topic"[Mesh] OR "Controlled Clinical Trial" [Publication Type] OR "Systematic Reviews as Topic"[Mesh] OR "Systematic Review" [Publication Type] OR "Meta-Analysis as

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Topic"[Mesh] OR "Meta-Analysis" [Publication Type] OR "randomized"[tiab] OR "randomised"[tiab] OR "randomly"[tiab] OR "trial"[tiab] OR "systematically"[tiab] OR "systematic review"[ti] OR "systematic reviews"[ti] OR "systematic literature review"[ti] OR "systematic scoping review"[ti] OR "systematic narrative review"[ti] OR "systematic evidence review"[ti] OR "systematic qualitative review"[ti] OR "systematic quantitative review"[ti] OR "systematic critical review"[ti] OR "systematic mixed studies review"[ti] OR "systematic mapping review"[ti] OR "Cochrane review"[ti] OR "Cochrane reviews"[ti] OR "systematic search and review"[ti] OR "systematic integrative review"[ti] OR "meta analysis"[ti] OR "meta analyses"[ti] OR "metanalysis"[ti] OR "metanalyses"[ti] OR "meta review"[ti] OR "meta reviews"[ti] OR "metareview"[ti] OR "metareviews"[ti] OR "umbrella review"[ti] OR "umbrella reviews"[ti]) **AND (**eng[la] OR und[la]**) NOT (**animals [mh] NOT humans [mh]**) AND** 2013:2023[dp]

CINAHL Complete (EBSCOhost)

***First search* - 22 results:**

(TI(“incontinence-associated dermatitis” OR “incontinence associated dermatitis” OR “IAD”) OR AB(“incontinence-associated dermatitis” OR “incontinence associated dermatitis” OR “IAD”) OR MH "Incontinence+" OR MH "Fecal Incontinence" OR MH "Urinary Incontinence" OR TI(“incontinence”) OR AB(“incontinence”)**) AND (**MH "Antifungal Agents+" OR TI(“fungal” OR “fungi” OR “fungus” OR “anti-fungal” OR “antifungal” OR “anti-fungals” OR “antifungals” OR “anti-mycotic” OR “antimycotic” OR “anti-mycotics” OR “antimycotics” OR “miconazole” OR “clotrimazole” OR “fluconazole” OR “bifonazole” OR “econazole” OR “nystatin” OR “terbinafine” OR “fungistatic” OR “fungistatics” OR “fungicidal” OR “fungicidals”) OR AB(“fungal” OR “fungi” OR “fungus” OR “anti-fungal” OR “antifungal” OR “anti-fungals” OR “antifungals” OR “anti-mycotic” OR “antimycotic” OR “anti-mycotics” OR “antimycotics” OR “miconazole” OR “clotrimazole” OR “fluconazole” OR “bifonazole” OR “econazole” OR “nystatin” OR “terbinafine” OR “fungistatic” OR “fungistatics” OR “fungicidal” OR “fungicidals”)**) AND (**LA English**) NOT (**(MH "Animals+" OR MH "Animal Studies" OR TI animal model*) NOT MH "Human"**) AND** PY 2013-2023

***Second search* - 80 results:**

((TI(“incontinence-associated dermatitis” OR “incontinence associated dermatitis” OR “IAD”) OR AB(“incontinence-associated dermatitis” OR “incontinence associated dermatitis” OR “IAD”)) OR ((MH "Dermatitis+" OR TI(“dermatitis”) OR AB(“dermatitis”)) AND (MH "Incontinence+" OR MH "Fecal Incontinence" OR MH "Urinary Incontinence" OR TI(“incontinence”) OR AB(“incontinence”))))**) AND** (MH "Clinical Trials+" OR MH "Systematic Review" OR MH "Meta Analysis" OR TI("randomized" OR "randomised" OR "randomly" OR "trial" OR "systematically" OR "systematic review" OR "systematic reviews" OR "systematic literature review" OR "systematic scoping review" OR "systematic narrative review" OR "systematic evidence review" OR "systematic qualitative review" OR "systematic quantitative review" OR "systematic critical review" OR "systematic mixed studies review" OR "systematic mapping review" OR "Cochrane review" OR "Cochrane reviews" OR "systematic search and review" OR "systematic integrative review" OR "meta analysis" OR "meta analyses" OR "metanalysis" OR "metanalyses" OR "meta review" OR "meta reviews" OR "metareview" OR "metareviews" OR "umbrella review" OR "umbrella reviews") OR AB("randomized" OR "randomised" OR "randomly" OR "trial" OR "systematically")) **AND (**LA English**) NOT (**(MH "Animals+" OR MH "Animal Studies" OR TI animal model*) NOT MH "Human"**) AND** PY 2013-2023

Embase (Elsevier)

Limited results to relevant publication types due to high number of conference abstracts in Embase

***First search* - 29 results:**

(“incontinence-associated dermatitis”:ti,ab OR “incontinence associated dermatitis”:ti,ab OR “IAD”:ti,ab OR 'incontinence'/mj OR 'urine incontinence'/mj OR 'feces incontinence'/mj OR “incontinence”:ti,ab**) AND (**'antifungal agent'/mj OR 'miconazole'/mj OR “fungal”:ti,ab OR “fungi”:ti,ab OR “fungus”:ti,ab OR “anti-fungal”:ti,ab OR “antifungal”:ti,ab OR “anti-fungals”:ti,ab OR “antifungals”:ti,ab OR “anti-mycotic”:ti,ab OR “antimycotic”:ti,ab OR “anti-mycotics”:ti,ab OR “antimycotics”:ti,ab OR “miconazole”:ti,ab OR “clotrimazole”:ti,ab OR “fluconazole”:ti,ab OR “bifonazole”:ti,ab OR “econazole”:ti,ab OR “nystatin”:ti,ab OR “terbinafine”:ti,ab OR “fungistatic”:ti,ab OR “fungistatics”:ti,ab OR “fungicidal”:ti,ab OR “fungicidals”:ti,ab**) AND** [english]/lim **NOT (**‘animal experiment’/de NOT (‘human experiment’/de OR ‘human’/de)**) AND** [2013-2023]/py **AND (**[article]/lim OR [article in press]/lim OR [review]/lim**)**

***Second search* - 143 results:**

((“incontinence-associated dermatitis”:ti,ab OR “incontinence associated dermatitis”:ti,ab OR “IAD”:ti,ab) OR (('dermatitis'/mj OR “dermatitis”:ti,ab) AND ('incontinence'/mj OR 'urine incontinence'/mj OR 'feces incontinence'/mj OR “incontinence”:ti,ab))**) AND (**'controlled clinical trial (topic)'/exp OR 'controlled clinical trial'/exp OR 'systematic review

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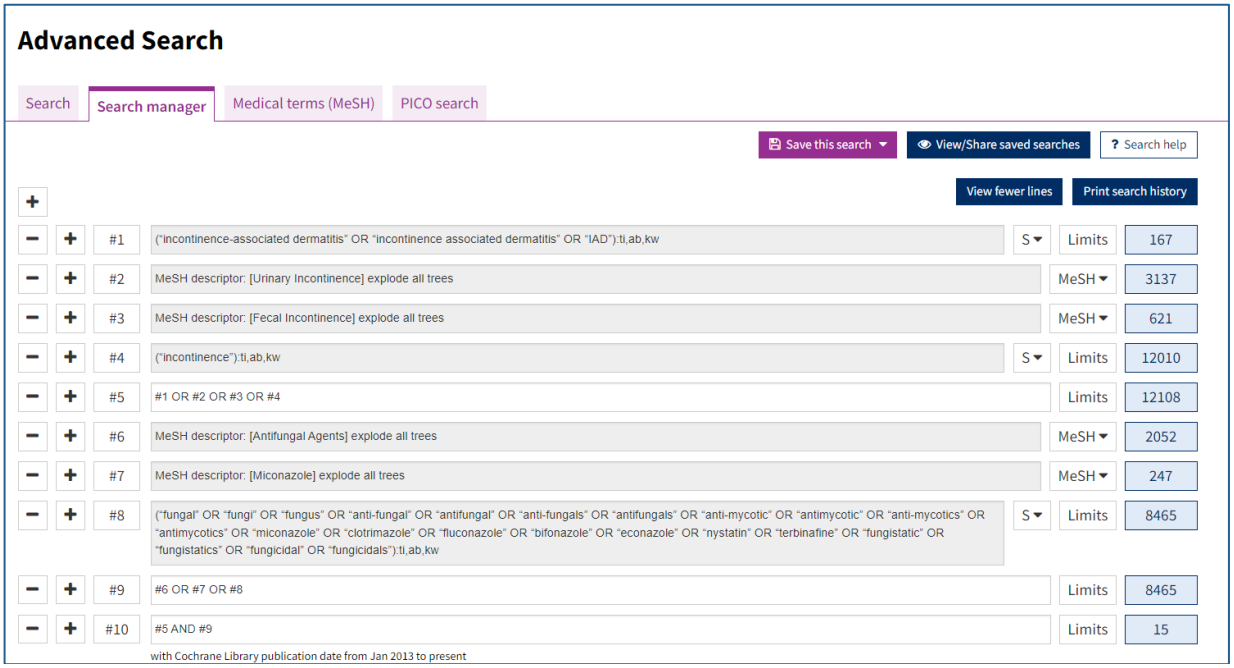
(topic)'/exp OR 'systematic review'/exp OR 'meta analysis (topic)'/exp OR 'meta analysis'/exp OR 'randomized':ti,ab OR 'randomised':ti,ab OR 'randomly':ti,ab OR 'trial':ti,ab OR 'systematically':ti,ab OR 'systematic review':ti OR 'systematic reviews':ti OR 'systematic literature review':ti OR 'systematic scoping review':ti OR 'systematic narrative review':ti OR 'systematic evidence review':ti OR 'systematic qualitative review':ti OR 'systematic quantitative review':ti OR 'systematic critical review':ti OR 'systematic mixed studies review':ti OR 'systematic mapping review':ti OR 'cochrane review':ti OR 'cochrane reviews':ti OR 'systematic search and review':ti OR 'systematic integrative review':ti OR 'meta analysis':ti OR 'meta analyses':ti OR 'metanalysis':ti OR 'metanalyses':ti OR 'meta review':ti OR 'meta reviews':ti OR 'metareview':ti OR 'metareviews':ti OR 'umbrella review':ti OR 'umbrella reviews':ti**) AND** [english]/lim **NOT (**'animal experiment'/de NOT ('human experiment'/de OR 'human'/de)**) AND** [2013-2023]/py **AND (**[article]/lim OR [article in press]/lim OR [review]/lim**)**

Cochrane Library (Wiley)

Further limited Trials tab results to year first published, from Jan 2013 to present.

***First search* – 10 results (Trials):**

ID Search Hits
#1 ("incontinence-associated dermatitis" OR "incontinence associated dermatitis" OR "IAD"):ti,ab,kw 167
#2 MeSH descriptor: [Urinary Incontinence] explode all trees 3137
#3 MeSH descriptor: [Fecal Incontinence] explode all trees 621
#4 ("incontinence"):ti,ab,kw 12010
#5 #1 OR #2 OR #3 OR #4 12108
#6 MeSH descriptor: [Antifungal Agents] explode all trees 2052
#7 MeSH descriptor: [Miconazole] explode all trees 247
#8 ("fungal" OR "fungi" OR "fungus" OR "anti-fungal" OR "antifungal" OR "anti-fungals" OR "antifungals" OR "anti-mycotic" OR "antimycotic" OR "anti-mycotics" OR "antimycotics" OR "miconazole" OR "clotrimazole" OR "fluconazole" OR "bifonazole" OR "econazole" OR "nystatin" OR "terbinafine" OR "fungistatic" OR "fungistatics" OR "fungicidal" OR "fungicidals"):ti,ab,kw 8465
#9 #6 OR #7 OR #8 8465
#10 #5 AND #9 with Cochrane Library publication date from Jan 2013 to present 15



***Second search* - 141 results (2 Cochrane Reviews, 139 Trials):**

ID Search Hits
#1 ("incontinence-associated dermatitis" OR "incontinence associated dermatitis" OR "IAD"):ti,ab,kw 167
#2 MeSH descriptor: [Dermatitis] explode all trees 5480
#3 ("dermatitis"):ti,ab,kw 10731
#4 #2 OR #3 12005
#5 MeSH descriptor: [Urinary Incontinence] explode all trees 3137

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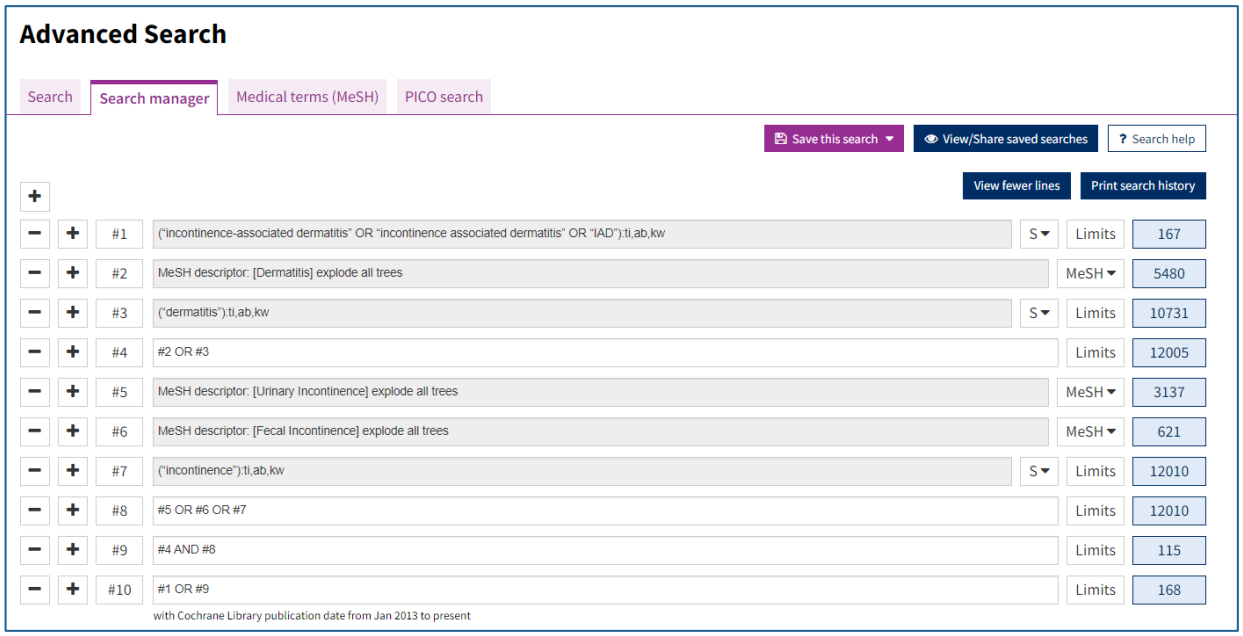
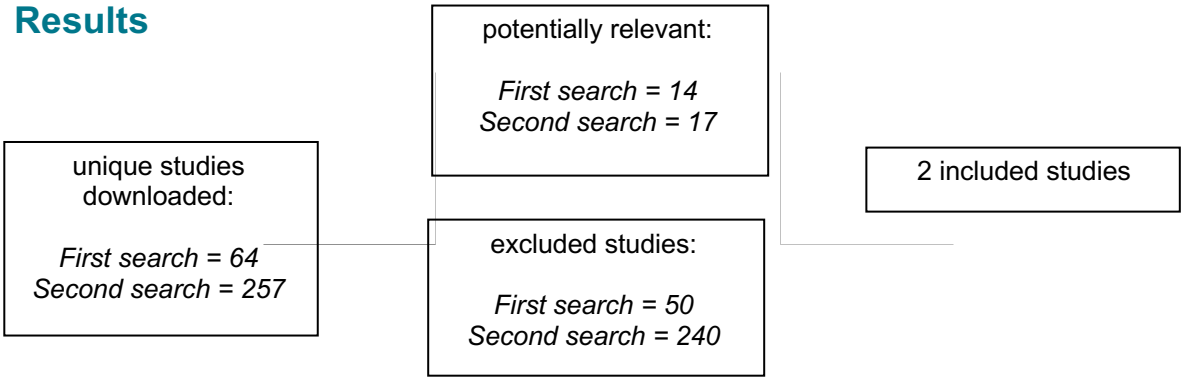
#6 MeSH descriptor: [Fecal Incontinence] explode all trees 621
#7 ("incontinence"):ti,ab,kw 12010
#8 #5 OR #6 OR #7 12010
#9 #4 AND #8 115
#10 #1 OR #9 with Cochrane Library publication date from Jan 2013 to present 168



Search process

For first and second searches, exported results from databases to EndNote Libraries, removed duplicates using the SR Accelerator Deduplicator tool (focused algorithm) https://sr-accelerator.com/#/deduplicator and imported into new EndNote Libraries of deduplicated results. Also removed results not relevant to inclusion criteria to identify potentially relevant studies. Copied annotated bibliography for potentially relevant results into word document for screening title and abstracts.

Results



First Author, year and type of study	Population and setting	Intervention or exposure tested	Study results	Assessment of quality and comments

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Pather et al. (2017). Systematic Review	General patient population	Effectiveness of topical skin products in reducing the occurrence (prevention) and severity (treatment) of IAD	10 studies (only 3 of which were RCTs) were included in the review (including 804 participants). The limited number of trials comparing agents meant that it was difficult to ascertain superiority of any individual agent. Skin care regimens that include the use of a skin protectant product are beneficial in preventing and treating IAD; however, there is no evidence that indicates superior outcomes of any one agent. Regardless of heterogeneity of skin assessment tools, study outcomes and methodology, most skin care products trialled (with the exception of soap and water regimens) demonstrated some skin protection qualities.	High level evidence yet the methodological quality of the included 10 studies was poor, overall. No studies were included that reported on treatment for fungal infections. Secondary fungal infiltration was presented as a concerning outcome of IAD.
Cunich et al. (2022). Systematic Review	General patient population	Costs, health outcomes and cost effectiveness of interventions for prevention and treatment of IAD.	17 included studies (10 on prevention, 1 on treatment, 6 on both prevention and treatment). 13 of the 17 tested barrier products. Barrier products may be cost-effective at preventing and/or treating IAD, however there is much uncertainty about this evidence. No product was identified to be superior to the other. Economics analyses are mixed, largely reporting the demands on the nursing resource.	High level evidence. Whilst the study inclusion criteria stated antifungal treatment, no studies directly addressing secondary fungal infections due to IAD were included in the review.

Summary

Pather et al. (2017) narratively synthesised results reporting efficacy in comparison studies. Interventions included 3 in 1 wash cloths (4 studies), foam cleansers (2 studies), no-sting barrier film (2 studies), no rinse cleanser protectant (2 studies) and Cavilon durable barrier cream (2 studies). Across these studies, seven assessment tools were used. Study designs included randomised controlled, quasi-experimental, non-controlled and prospective cohort studies. Prevalence rates of IAD in included studies ranged from 50% to 66Information sources were identified as important, and that there is a need to help understand the best approaches for managing IAD, the risks of side effects of these approaches, and the potential costs.

Cunich et al. (2022) also found that there was no superior product, but that non-pharmacological interventions in the prevention of IAD were effective. Zinc and Cavilon were also both equally effective in prevention, but there was limited guidance on anti-fungal care/treatment of fungal infiltration. These authors also identified that there is a lack of reliable tools to assessment IAD, and data reporting of patient experience or using patient reported outcomes was absent overall. Outcomes from included studies were reported as effectiveness outcomes (primary and secondary), quality of

life and economic outcomes. 16 studies included a cost analysis, one study included a cost effectiveness analysis (Cavilon was identified to be more cost-effective when compared to usual care). 6 studies identified that barrier products brought additional cost savings to standard of care. 2 studies found additional cost savings from cleansers and bathing.

Overview of other relevant studies

Other lower level evidence supported use of products that make the skin more acidic, which can be conducive to reducing fungal colonisation (Rippke et al., 2018; Takahashi et al., 2020). Best available evidence for managing secondary fungal infections from IAD has been identified in several clinical guidelines (Beeckman et al., 2015; Barakat-Johnson et al., 2021; Connolly, 2021; Regional Wounds Victoria et al., n.d.; Ticchi, 2018). Antimicrobial stewardship guidance was also a widely referenced resource (Australian Medicines Handbook [AMH], 2018).

Implications for Practice/research

There is an evidence gap about the best ways to treat secondary fungal infections from IAD. Antifungal infiltration is more likely in prolonged IAD, and in more severe IAD (Cunich et al., 2022). Assessment tools are often subjective and applied inconsistently (Pather et al., 2017). Introduction of first line anti-microbials is reasonable, but prolonged treatment does not align with antimicrobial stewardship principles (AMH, 2018). There is research currently underway (Barakat-Johnson et al., 2021) that may address the evidence practice gap regarding treatment of secondary fungal infections from IAD. Current guidance suggests that anti-fungal treatment should be assessed at 2 weeks (AMH, 2018), so second line approaches can be considered, such as referrals to specialist teams (wound care nurses, dermatology) or other non-pharmacological treatments.

Local guidance for clinical teams optimises outcomes for patients impacted by IAD and fungal infections (Pather et al., 2017; Barakat-Johnson et al., 2022). Discussions about these findings during the CAT group meetings identified that despite the limitations in the evidence about treatments, asking the following questions can improve the quality of care provided:

- What resources are in place to provide education to clinical teams on prevention care?
- Have all strategies used to address IAD and/or fungal infections been documented?
- When, and who should decide to initiate anti-fungal treatments?
- Who is assessing the patient's skin at treatment initiation?
- How will this be documented/recorded (eg., creamy appearance/spotty rash)?
- What patient characteristics need to be considered when developing a treatment plan for secondary fungal infections from IAD (eg., burden and level of incontinence)?
- At two weeks, what assessments are required? How will it be established whether treatment is working?
- When do second/third/fourth line treatments need to be considered?

Finally, discussion within the CAT group team members identified that even though multidisciplinary management is needed, there are varying resources available to each professional group, and there may be opportunities for interdisciplinary knowledge sharing.

What would you tweet? (140 characters)

It is recommended to stop and assess effectiveness of anti-fungal treatment after 2 weeks when caring for patients with secondary infections from IAD.

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Critical Appraisal Topic Group Team Members

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Cunich, M., Barakat-Johnson, M., Lai, M., Arora, S., Church, J., Basjarahil, S., Campbell, J. L., Disher, G., Geering, S., Ko, N., Leahy, C., Leong, T., McClure, E., O'Grady, M., Walsh, J., White, K., & Coyer, F. (2022). The costs, health outcomes and cost-effectiveness of interventions for the prevention and treatment of incontinence-associated dermatitis: A systematic review. *International Journal of Nursing Studies*, *129*, Article 104216. https://doi.org/10.1016/j.ijnurstu.2022.104216

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