Development of the Canadian Moisture-Associated Skin Damage (CAN-MASD) tool

Moisture-associated skin damage (MASD) is a common clinical problem. Although there are several assessment instruments to categorise and describe moisture skin damages, they are not designed to monitor change over time.

Aim: To discuss the development of the Canadian-MASD (CAN-MASD) tool for the assessment and monitoring of MASD.

Methods: A scoping review was conducted to identify published instruments for the assessment of MASD. Ten assessment tools were identified. Based on literature review, we identified 12 clinical parameters for a new Canadian-MASD (CAN-MASD) tool : size, maceration, erythema, rash, oedema, induration, weeping, erosion, blister/bulla formation, pain, pruritus and infection.

Conclusion: The CAN-MASD Tool is proposed to help clinicians identify and monitor the extent and severity of moisture skin damages. It has face and content validity that can be used in clinical practice and research.

Joshua Moralejo
MScCH: WPC, RN, BScN, NSWOC, WOCC(C), IIWCC, Clinical Nurse Specialist, Toronto Grace Health Center, President Elect Nurse Specialized in Wound, Ostomy and Continence

Kevin Woo
PhD, RN, NSWOC, WOCC(C) ,FNSWOC, Professor, Queen's University, Adjunct Professor, Curtin University, Education Investigator 2, The Institute for Education Research (TIER), University Health Network, Chief Research Officer, Nurses Specialized in Wound Ostomy & Continence, Kingston, Ontario, Canada

Key words
- Moisture-associated skin damage
- Canadian Moisture-Associated Skin Damage (CAN-MASD) tool

Moisture-associated skin damage (MASD) is an umbrella term in reference to skin impairment secondary to persistent and/or repetitive exposure to moisture and manifests itself in a wide array of signs and symptoms, often involves inflammation, erosion or desquamation, and superimposed infection (Gray et al, 2011; Gray et al, 2021). Depending on the affected location, source and types of effluence or irritants, MASD may be described as contact irritant dermatitis, incontinence-associated dermatitis (IAD), intertriginous dermatitis (ITD) or periwound and peristomal moisture damage (Gray et al, 2022).

Usually limited to the epidermal and dermal layers of the skin, the likelihood and severity of the MASD is determined by the duration and intensity of skin exposure to moisture and irritants along with skin temperature, pH, and its microbiota (Gray et al, 2011; Beeckman, 2017; Qi et al, 2024). Other systemic factors, such as age, continence status (particularly dual incontinence), obesity, cognitive impairment, immobility, excessive perspiration, heavily exudating wounds, inappropriate choice of dressings or ostomy appliance and oedema due to venous disease have also been correlated with MASD (Black et al, 2011; Colwell et al, 2011; Yates, 2020; Hill and Smith, 2023). The exact prevalence of MASD remains elusive, with rates ranging from 5.6% to 50% in various clinical settings and patient populations (Werth and Justice, 2019; Holroyd, 2021).

Although the evidence is limited, the experience of having MASD can be devastating due to pain, burning, pruritus, odour and other related symptoms which, all in all, compromises a person's quality of life (Haesler, 2017; Woo et al, 2017). MASD may also put the skin at risk for other injuries. A study conducted by Gray and Giuliano (2018) examined the relationship between IAD and pressure injury development. They reported a high prevalence of pressure injuries among persons with incontinence. Moisture may augment the damaging effect of shear on skin through several intricate mechanisms and has been purported to render individuals five times more likely to develop a pressure injury (Beeckman, 2017).

Timely and diligent assessment of MASD followed by prompt intervention may minimise risk of pressure injuries. While several instruments have been introduced to describe, grade and classify MASD, lacking in the existing literature are metrics for the evaluation and monitoring of these skin damages. We recognise the need to develop a measurement tool for the assessment of signs and symptoms associated with MASD to address the existing practice gap.

Aim

This paper aims to discuss the development of Canadian Moisture-Associated Skin Damage (CAN-MASD) tool for the assessment of MASD. The severity of MASD is operationalised in terms of visible and observable skin changes along with patient reported experiences/symptoms.

Methods

This project involved a literature review to explore in the literature measurement methods, scales, instruments and taxonomy associated with the assessment of MASD and related skin changes. A search strategy was developed with

the support of an experienced health sciences librarian. Databases including OVID, Medline and CINAHL were used to extract relevant literature utilising the following keywords: "moisture damage", "moisture associated skin damage", "peristomal skin" and "irritant contact dermatitis". The review included studies that focused on adults aged 18 years or older across various healthcare settings from intensive, long-term to ambulatory care.

We excluded studies that focused on the paediatric population; in whom damaged premature skin may not emulate similar manifestations that we encounter in the adult populations. Only studies with a measurement method of skin damages were considered. We also conducted manual searches in best practice guidelines from key wound and skin care professional associations. Editorials, commentaries and conference proceedings were excluded. Abstract and title were screened by two independent reviewers to assess for eligibility based on the inclusion criteria.

The reviewers independently screened and selected articles for review based on a consensus between the two reviewers. The disagreement between the reviewers was resolved through discussion when necessary. Data were extracted and charted from included studies by the two independent reviewers to tabulate metrics for MASD assessment to inform the development of CAN-MASD. Twelve clinically relevant indicators were identified and constitutive of a preliminary instrument for phase 2 evaluation.

Results

A total of 52 peer-reviewed publications were initially identified; only 16 publications were deemed appropriate for in-depth review. In total, we found 10 unique assessment instruments in these studies. Eight of the instruments identified were related to incontinence-associated dermatitis (IAD) while two of the tools were used for peristomal skin complications with assessment parameters that captures moisture related skin breakdown. **Table 1** provides a comparative review of the instruments related to the name of the scale, the type of MASD it assesses, the assessment parameters included, scale characteristic and existing validation.

PAT was initially developed by Nix (2002) to evaluate the risk of perineal skin breakdown. The tool comprises of four-parameters: intensity of irritant (type and consistency), duration of exposure, condition of perineal skin (erythema, erosion and cutaneous candidiasis) and factors which predisposes the person to diarrhea. Each parameter is rated on a three-point scale to indicate the level of risk. Highest possible score is 12 that represents the greatest level of risk (Nix, 2002). The tool has been adapted and translated to Chinese and Thai; content validity index of over 0.90 was reported in two different studies (Li et al, 2019; Simim et al, 2024). Interrater reliability between two nurse assessors was estimated by the calculation Kappa coefficient, a high value of 0.92 was reported (Simim et al, 2024).

Incontinence-associated Dermatitis and Severity Instrument (IADS)

IADS requires the clinician to assess 13-skin regions that are affected by irritants from incontinence including skin in the perianal, bilateral upper and lower gluteal, genitalia, lower abdomen, bilateral inner and posterior thigh areas (Borchert et al, 2010). Each area is evaluated for the presence of redness, rash and skin loss on a five-point scoring system (Borchert et al, 2010). Total score ranges from 0-52 with higher scores indicating worse IAD condition. IADS has an excellent reliability with an intraclass correlation coefficient value of 0.98 (Tezcan et al, 2022).

Incontinence-associated Dermatitis Intervention Tool (IADIT-D)

The IADIT-D categorises IAD into early, moderate or severe types with or without fungal rash based on clinical evaluations (Braunschmidt et al, 2013). Intended as an assessment to guide care planning, the tool contains customisable interventions to match the severity of IAD. Interrater agreement was 84% between two nurses in the evaluation of long-term care residents (Tezcan et al, 2022).

Incontinence-associated Dermatitis Severity Categorisation Tool

In 2014, an international panel of experts on IAD met and suggested a simplified method to categorise IAD based on the severity of the moisture breakdown (Beeckman et al, 2015). The IAD Severity Categorization tool has three levels of severity: being at risk, Category 1 with some mild erythema, and Category 2 with both erythema and skin breakdown indicating moderate-severe dermatitis (Beeckman et al, 2015). Prevention and treatment are delineated and incorporated as part of the tool. No validation study was found.

Skin Moisture Alert Reporting Tool (S.M.A.R.T.)

The S.M.A.R.T. Tool is a guide endorsed by the National Institute for Health and Care Excellence to categorise moisture dermatitis involving IAD, ITD, periwound and peristomal moisture skin damage (Parnham et al, 2020). MASD

Table 1. Summary of IAD and Peristomal MASD Instruments.

Scale	Type of MASD Involved	Assessment Parameters or Sections	Scale/Instrument Characteristics	Validation
Perineal Risk Assessment Tool (PAT) (Nix, 2002)	IAD	Four-parameters: intensity of irritant (type and consistency), duration of exposure, condition of perineal skin (erythema, erosion and cutaneous candidiasis), and factors which predisposes the person to diarrhea (Nix, 2002)	Each parameter is rated in a 3-point scale (1-3) to determine the level of risk (Nix, 2002) Highest possible score is 12 with higher scores indicating greater level of risk (Nix, 2002)	Adapted and translated to Chinese and Thai; content validity index of 97.22% and 0.90 were reported respectively (Li et al, 2019; Simim et al, 2024) Interrater reliability between two nurse assessors was high (Kappa coefficient of 0.92) (Simim et al, 2024)
Incontinence-associated Dermatitis and Severity Instrument (IADS) (Borchert et al, 2010)	IAD	13-skin regions (perianal, bilateral upper and lower gluteal, genitalia, lower abdomen, and bilateral and posterior thigh) are assessed for the presence of redness, rash, and skin loss (Borchert et al, 2010)	5-point scale is used for each skin region: Redness (0-2 – based on degree), Rash (3), Skin Loss (4) (Borchert et al, 2010) Total score ranges from 0–52 with higher scores indicating worse IAD condition (Borchert et al, 2010)	Has excellent reliability with an intraclass correlation coefficient value of 0.98 (Tezcan et al, 2022)
Incontinence-associated Dermatitis Intervention Tool (IADIT-D) (Braunschmidt et al, 2013)	IAD	Considers varying presentation of redness, presence of skin loss, bleeding, warmth, pain and signs of fungal skin rash (Braunschmidt et al, 2013)	Categorises IAD into early, moderate or severe types with or without fungal rash based on clinical evaluations (Braunschmidt et al, 2013) Intended as an assessment and care planning tool, customizable interventions are matched to the severity of IAD (Braunschmidt et al, 2013)	Interrater agreement was 84% between two nurses in the evaluation of long-term care residents (Tezcan et al, 2022)
Incontinence-associated Dermatitis Severity Categorization Tool (Beeckman et al, 2015)	IAD	Assess presence of redness with or without skin breakdown (Beeckman et al, 2015)	Has three levels of severity from being at risk to Category 1 with some mild erythema and Category 2 with both erythema and skin breakdown indicating moderate-severe dermatitis (Beeckman et al, 2015) Prevention and treatment are defined for each level of MASD (Beeckman et al, 2015)	Not validated
Skin Moisture Alert Reporting Tool (S.M.A.R.T.) (Parnham et al, 2020)	IAD, ITD, Periwound MASD, Peristomal MASD	Assesses erythema, skin irritation, and oozing or bleeding (Parnham et al, 2020)	MASD is categorized as either mild, moderate or severe based on the degree of skin breakdown (Parnham et al, 2020) Suggested management strategies are incorporated for each skin category (Parnham et al, 2020)	Not validated
Ghent Global IAD Categorization Tool (GLOBIAD) (Beeckman et al, 2017)	IAD	Assesses persistent redness, skin loss, and infection (Beeckman et al, 2017)	Two distinct categories – persistent redness (Category 1) and skin loss (Category 2) with subcategories based on the absence (A) or presence (B) of secondary infection (Beeckman et al, 2017) Additional signs and symptoms such as the presence of maceration or burning sensation or pain are shared between categories (Beeckman et al, 2017)	Cohen's Kappa value of 0.61 and Fleiss' Kappa value 0.41 suggested satisfactory levels of agreement among 34 raters (Beeckman et al, 2018)
Ghent Global IAD Monitoring Tool (GLOBIAD-M) (Van den Bussche et al, 2018)	IAD	Four section: General Patient Information; GLOBIAD Categorization; Objective assessment includes: persistent redness, skin loss, oedema, maceration and signs of infection; Subjective assessment captures: itching, tingling, burning and pain experience (Van den Bussche et al, 2018)	Uses Categories on GLOBIAD (Van den Bussche et al, 2018) Estimates percentage of erythema and skin loss across the bilateral gluteal and posterior upper thigh regions (Van den Bussche et al, 2018) Pain intensity assessed using a numerical rating scale (Van den Bussche et al, 2018)	Interrater reliability was established with Kappa Values of 0.61 (Van den Bussche et al, 2018) Highest intraclass correlation values were 0.83 and 0.87 for the evaluation of redness and skin loss respectively while oedema was less reliable with Kappa value of 0.27 (Van den Bussche et al, 2018)
Minimum Data Set for Incontinence-Associated Dermatitis (MDS-IAD) (Van den Bussche et al, 2018)	IAD	Five components: Administrative Data (type of healthcare setting); Patient Data; Incontinence Status (incorporated MDS descriptions for severity); GLOBIAD Categorization (includes location of IAD and a section to capture incidence); Perianal Management Strategies (Van den Bussche et al, 2018)	Uses Categories on GLOBIAD (Van den Bussche et al, 2018)	Substantial interobserver agreement on urinary incontinence section (Kappa value of 0.68); moderate agreement on fecal incontinence (Kappa value of 0.55); poor to moderate agreement on perianal management (Van den Bussche et al, 2018)
Peristomal Skin Lesions Assessment (SACS) Instrument (Bosio et al, 2007)	Non-specific to MASD but has elements related to peristomal MASD	Assess and locates peristomal skin lesions (Bosio et al, 2007)	Lesions can be categorised as peristomal erythema (L1), erosions (L2), or full-thickness ulcers extending to the adipose tissue and deeper tissue compartments (L3), full-thickness ulceration with devitalised tissue (L4) or atypical proliferative lesions (LX) (Bosio et al, 2007)	Good interrater reliability at Kappa value of 0.91 (Bosio et al, 2007) Adapted and validated in Turkey – Content validity index (1) with high value of inter-observer agreement (Kappa value of 0.90) (Ay and Bulut, 2015)
Ostomy Skin Tool (OST) 2.0 (Jemec et al, 2011; Martins et al, 2022)	Non-specific to MASD but has elements related to peristomal MASD	Formerly called OST – assesses discoloration (D), erosion (E), and tissue overgrowth (T) (Jemec et al, 2011) Revised OST 2.0 included six patient reported outcomes to explore the visible symptoms (bleeding, weeping and ulcers/sores) and sensation symptoms (itching, pain and burning) (Martins et al, 2022)	Pain, Itch and Burning experience are rated from 0-10 (Martins et al, 2022) Size of discolouration are captured as either less than or greater than 10cm2; Discolouration and Tissue Overgrowth are identified on the peristomal plane (Martins et al, 2022) Clinical decision pathway to determine level of peristomal skin complications (Martins et al, 2022)	Moderate to good degree of test-retest reliability for the pain, itching, and burning scores (ICC = 0.673-0.871); good reliability for the decision tree score (ICC = 0.735-0.823); and moderate to good reliability for the presence of ulcers (ICC = 0.645-0.853) (Jemec et al, 2023) Patient-reported items were weak to moderate reliability (correlation coefficients: 0.30-0.46) (Jemec et al, 2023)

is categorised as either mild, moderate or severe based on the degree of erythema, skin irritation and presence of oozing or bleeding. Psychometric properties of the tool has not been examined (Parnham et al, 2020).

Ghent Global IAD Categorisation Tool (GLOBIAD)

GLOBIAD is a categorisation tool developed by an international panel of experts (Beeckman et al, 2017). According to the panel IAD can be recognised by the presence of maceration, vesicle, shiny appearance, swelling and pain/burning and assigned to two categories; whether persistent redness (category 1) or skin loss (category 2) is evident. Each category is differentiated into two subcategories to remark the absence (A) or presence (B) of secondary infection. Cohen's Kappa value of 0.61 and Fleiss' Kappa value 0.41 suggested satisfactory levels of agreement among raters' evaluation of MASD images (Beeckman et al, 2018).

Ghent Global IAD Monitoring Tool (GLOBIAD-M)

GLOBIAD-M has four categories: general data (for patient information), categorisation of IAD (derived from the GLOBIAD), objective assessment of IAD and patient experience (Van den Bussche et al, 2018). Assessment of IAD includes the estimated percentage of erythema and skin loss across the bilateral gluteal regions and posterior upper thighs. The raters are also asked to examine the skin and indicate if oedema, maceration and signs of infection are present or not. Lastly, patients will be approached to provide a rating of pain intensity related to IAD on a 11-point numerical rating scale. The overall Kappa for interrater reliability was 0.61 (Van den Bussche et al, 2018). Specifically, the highest intraclass correlation values were 0.83 and 0.87 for the evaluation of redness and skin loss, respectively (Van den Bussche et al, 2018). The assessment of oedema was less reliable with Kappa value of 0.27.

Minimum Data Set for Incontinence-associated Dermatitis (MDS-IAD)

MDS-IAD contains five components: "administrative data" to identify the type of health care setting; "patient data" related to date of birth and gender; "incontinence" which incorporated MDS descriptions for severity of both faecal or urinary types and the presence of diarrhea; "IAD categorisation" using the GLOBIAD; "location" of the dermatitis and a section to capture incidence; and "perianal management" (Van den Bussche et al, 2018). A pilot study was conducted involving 108 nursing home residents to test the instrument's reliability (Van den Bussche et al, 2018). Substantial interobserver agreement was reached in the urinary incontinence section with Kappa value of 0.68 versus moderate agreement was noted in faecal incontinence with a Kappa value of 0.55 (Van den Bussche et al, 2018). Poor to moderate agreement was noted in the perianal management section, which could be secondary to differences in care practices.

Peristomal Skin Lesions Assessment (SACS) Instrument

The peristomal skin lesion assessment instrument is designed to describe peristomal skin complications and their locations on the peristomal skin (Bosio et al, 2007). Lesions can be categorised as peristomal erythema (L1), erosions (L2) or full-thickness ulcers extending to the adipose tissue and deeper tissue compartments (L3), full-thickness ulceration with devitalised tissue (L4) or atypical proliferative lesions (LX) (Bosio et al, 2007). The tool was noted to have good interrater reliability at Kappa value of 0.91 (Bosio et al, 2007). The SACS instrument was adapted in Turkey. Content validity index was 1 with high value of inter-observer agreement (Kappa value of 0.90) (Ay and Bulut, 2015).

Ostomy Skin Tool (OST) 2.0

This tool allows assessor to comment on the abnormal peristomal skin namely discoloration (D), erosion (E) and tissue overgrowth (T) (Jemec et al, 2011). Each indicator is evaluated from 0-3 with the higher number indicating more severe skin damages; the possible DET score ranges from 0-15 (Martins et al, 2022). The revised OST 2.0 included six patient reported outcomes to explore the visible symptoms (bleeding, weeping and ulcers/sores) and sensation symptoms (itching, pain and burning). In a study by Jemec and colleagues (2023), the investigators reported moderate to good degree of test-retest reliability for the pain, itching and burning scores (intraclass correlation coefficient = 0.673-0.871); good reliability for the decision tree score (ICC = 0.735-0.823); and moderate to good reliability for the presence of ulcers (ICC = 0.645-0.853). The correlations between the six patient-reported items were weak to moderate; correlation coefficients between 0.30 and 0.46 (Jemec et al, 2023).

Based on literature review, we identified 12 clinical parameters: size, maceration, erythema, rash, oedema, induration, weeping, erosion, blister/bulla formation, pain, pruritus and infection.

Discussion

MASD is a common and distinct clinical entity. Over the last few decades, there has been a growing body of scientific literature focused on developing a taxonomy and standardised approach to describe and evaluate MASD. Based on review of the literature over the last 10 years, we found 10 different instruments for the assessment of moisture skin damage. There are several deficiencies in these instruments that warrant attention. First, most instruments are originally designed to determine if MASD is present or not. They are not sensitive and responsive to describe changes in the severity of IAD. Second, the criteria to assign the severity of moisture skin damages are guided by clusters of exhibited signs and symptoms; each contained different sets of assessment parameters and definitions of severity.

Inherent in nominal and categorical tools is the peril of over-generalisation and simplification using indicators that are not mutually exclusive among categories. Furthermore, skin changes are not individually evaluated. Signs and symptoms of MASD are not all or none phenomenon, lending credence to a more scrupulous and detailed approach to assessment. Inconsistency could arise from the lack of clarity on how severity is assigned; whether the number or intensity of signs within a cluster should be justified for the incremental changes that commensurate with the worsening of MASD. Apart from item limitations, the brevity of the scales is not sensitive or responsive enough to detect nuanced but appreciable changes. For the purpose of clinical research and quality evaluation, it is appealing to collect interval data especially for a skin condition that could change drastically within a short duration of time.

The Canadian Moisture-Associated Skin Damage (CAN-MASD) Tool

The lack of an ideal instrument in the literature provides the impetus for us to develop the Canadian Moisture-Associated Skin Damage (CAN-MASD) tool **[Figure 1]**. Based on a review of the literature (phase 1), we distilled the information and synthesised key assessment parameters that met the criteria for face validity to measure the severity of MASD. The MASD-tool instrument consists of three sections. The first part of the tool involves identification and documentation of the type of MASD present such as IAD, periwound moisture dermatitis, peristomal moisture dermatitis or ITD. Assessors could add "other" irritant source, such as moisture-associated skin damage related to secretions or leakage from a tracheostomy or an enteral feeding tube. Identification of the types and prevalence of MASD types may inform quality improvement initiatives for targeted patient populations and care trends. The second part includes assessment of signs and symptoms that were accepted and validated by the expert panel. MASD will be evaluated: Size (surface area – length x width in cm), Skin changes (maceration, erythema, rash, oedema, induration and weeping), Lesion (erosion and blister/bulla formation), and Symptoms (pain and pruritus). Most assessment parameters are evaluated for its severity and described on a four-point Likert-like scale from absent (0) to mild (1), moderate (2) or severe (3). We proposed that scoring individual MASD characteristics can provide a more comprehensive picture of the severity of a MASD. Finally, two closed-ended questions were included for the assessor to indicate if fungal and bacterial skin infections are present. Infection may coexist with MASD that should be addressed promptly by interprofessional healthcare team.

Limitations

Each assessment parameter is highly subjective; further studies will be required to establish intra-rater and interrater reliability. Clinicians with minimal training in skin and wound care may lack knowledge and clinical acumen to assess MASD using this instrument.

Conclusion

Regardless of the measurement methods, assessment should begin with understanding the person's risk for developing MASD. Timely identification of potential sources of moisture may prompt preventative action aimed at minimising skin damage and risk for pressure injury. Ongoing assessment of skin health should be standardised to monitor if interventions are effectual and skin damages are worsening or abating. The CAN-MASD Tool is proposed to help clinicians identify and monitor the extent and severity of moisture skin damages. It has face and content validity that can be used in clinical practice and research. ●

References

Ay A, Bulut H (2015) Assessing the validity and reliability of the peristomal skin lesion assessment instrument adapted for use in Turkey. *Ostomy Wound Manage* 61(8): 26–34

Beeckman D (2017) A decade of research on incontinence-associated dermatitis (IAD): evidence, knowledge gaps and next steps. *J Tissue Viability* 26(1): 47–56. doi: 10.1016/j.jtv.2016.02.004.

Beeckman D, Campbell J, Campbell K, et al (2015) *Proceedings of the Global IAD Expert Panel. Incontinence-associated Dermatitis: Moving Prevention Forward*. London: Wounds International. Available at: https://woundsinternational.com/consensus-documents/incontinence-associated-dermatitis-moving-prevention-forward/ (accessed 18.09.2026)

Part 1: *Identify the type of Moisture-Associated Skin Damage.*				
☐ Incontinence-Associated Dermatitis	☐ Periwound Moisture Dermatitis	☐ Peristomal Moisture Dermatitis	☐ Intertriginous Dermatitis	☐ Other:

Part 2: *Assess for signs and symptoms of moisture dermatitis.* Score each assessment element based on the level of severity from 0-3.					
Clinical parameters	**Assessment elements**	**Score**			
		0	**1**	**2**	**3**
Size	*Surface area (LxW)*	None	<4cm² (confined to periskin)	>4-10cm² (extends to adjacent body regions)	>10cm³ (extends to adjacent body regions)
Skin changes	*Maceration*	None	Mild	Moderate	Severe
	Erythema	None	Mild	Moderate	Severe
	Rash	None	Mild	Moderate	Severe
	Edema	None			Present
	Induration	None			Present
	Weeping	None	Mild	Moderate	Severe
Lesion	*Erosion*	None	Mild	Moderate	Severe
	Blister/Bulla formation	None			Present
Symptoms	*Pain (Stinging, burning)*	None	Mild	Moderate	Severe
	Pruritus (Itching)	None	Mild	Moderate	Severe
	Tabulate score:				
	Total score (0-33): Mild Dermatitis (Score 1-8); Moderate (Score 9-16); Severe (Score 17-33)				

Part 3: *Assess for the presence of secondary infection*		
Infection	Does the patient have signs and symptoms of cutaneous fungal infection, such as diffused satellite lesions (vesicles/pustules), skin scaling, pain or pruritus?	☐ **Yes** ☐ **No**
	Does the patient have signs and symptoms of bacterial infection such as increase in skin temperature, inflammation, exudate, purulence, increased surface area of breakdown or pain?	☐ **Yes** ☐ **No**

Figure 1

Figure 1. Canadian Moisture-Associated Damage (CAN-MASD) Tool (Moralejo and Woo, 2024).

Beeckman D, Van den Bussche K, Alves P, et al (2018) Towards an international language for incontinence-associated dermatitis (IAD): design and evaluation of psychometric properties of the Ghent global IAD categorization tool (GLOBIAD) in 30 countries. *Br J Dermatol* 178(6): 1331–1340. doi: 10.1111/bjd.16327.

Beeckman D, Van den Bussche K, Alves P, et al (2017) *The Ghent global IAD categorisation tool (GLOBIAD)*. Ghent: Skin Integrity Research Group, Ghent University.

Black JM, Gray M, Bliss DZ, et al (2011) MASD part 2: incontinence-associated dermatitis and intertriginous dermatitis: a consensus. *J Wound Ostomy Continence Nurs* 38(4): 359–372. doi: 10.1097/WON.0b013e31822272d9.

Borchert K, Bliss DZ, Savik K, Radosevich DM (2010) The incontinence-associated dermatitis and its severity instrument: development and validation. *J Wound Ostomy Continence Nurs* 37(5): 527–535. doi: 10.1097/WON.0b013e3181edac3e.

Bosio G, Pisani F, Lucibello L, et al (2007) A proposal for classifying peristomal skin disorders: results of a multicenter observational study. *Ostomy Wound Manage* 53(9): 38–43

Braunschmidt B, Müller G, Jukic-Puntigam M, Steininger A (2013) The inter-rater reliability of the incontinence-associated dermatitis intervention tool-d (IADIT-D) between two independent registered nurses of nursing home residents in long-term care facilities. *J Nurs Meas* 21(2): 284–295. doi: 10.1891/1061-3749.21.2.284.

Colwell JC, Ratliff CR, Goldberg M, et al (2011) MASD part 3: peristomal moisture-associated dermatitis and periwound moisture-associated dermatitis: a consensus. *J Wound Ostomy Continence Nurs* 38(5): 541–555. doi: 10.1097/WON.0b013e31822acd95.

Gray M, Black JM, Baharestani MM, et al (2011) Moisture-associated skin damage: overview and pathophysiology. *J Wound Ostomy Continence Nurs* 38(3): 233-241. doi: 10.1097/WON.0b013e318215f798.

Gray M, Bliss DZ, McNichol L (2022) Moisture-associated skin damage: expanding and updating practice based on the newest ICD-10-CM codes. *J Wound Ostomy Continence Nurs* 49(2): 143-151. doi: 10.1097/WON.0000000000000865.

Gray M, Bliss DZ, McNichol L, Cartwright D (2021) Moisture-associated skin damage: a historic step forward. *J Wound Ostomy Continence Nurs* 48(6): 581–583. doi: 10.1097/WON.0000000000000827.

Gray M, Giuliano KK (2018) Incontinence-associated dermatitis, characteristics and relationship to pressure Injury: a multisite epidemiologic analysis. *J Wound Ostomy Continence Nurs* 45(1): 63–67. doi: 10.1097/WON.0000000000000390.

Haesler E (2017) Evidence summary: moisture associated skin damage: classification and assessment. *Wound Pract Res* 26(2): 113-116

Hill RH, Smith SL (2023) Peristomal moisture-associated skin damage treatment: use of cyanoacrylate liquid skin protectant: a case series. *J Wound Ostomy Continence Nurs* 50(6): 521–524. doi: 10.1097/WON.0000000000001027.

Holroyd S (2021) Moisture-associated skin damage caused by incontinence. *J Community Nurs* 35(4): 58-64

Jemec G, Herschend NO, Hansen HD, et al (2023) Psychometric validation of the ostomy skin tool 2.0. *PeerJ* 11: e16685. doi: 10.7717/peerj.16685.

Jemec GB, Martins L, Claessens I, et al (2011) Assessing peristomal skin changes in ostomy patients: validation of the ostomy skin tool. *Br J Dermatol* 164(2): 330–335. doi: 10.1111/j.1365-2133.2010.10093.x.

Li YM, Lee HH, Lo YL, Chao HL (2019) Perineal assessment tool (PAT-C): validation of a chinese language version and identification of a clinically validated cut point using ROC curve analysis. *J Wound Ostomy Continence Nurs* 46(2): 150–153. doi: 10.1097/WON.0000000000000510.

Martins L, Down G, Andersen BD, et al (2022) The ostomy skin tool 2.0: a new instrument for assessing peristomal skin changes. *Br J Nurs* 31(8): 442–450. doi: 10.12968/bjon.2022.31.8.442.

Nix DH (2002) Validity and reliability of the perineal assessment tool. *Ostomy Wound Management* 48(2): 43–49.

Parnham A, Copson D, Loban T (2020) Moisture-associated skin damage: causes and an overview of assessment, classification and management. *Br J Nurs* 29(12): S30–S37. doi: 10.12968/bjon.2020.29.12.S30.

Qi L, Zhao Q, Guo L, et al (2024) Prevention and care for moisture-associated skin damage: a scoping review. *J Tissue Viability* 33(3): 362–375. doi: 10.1016/j.jtv.2024.06.002.

Simim S, Banharak S, Panpanit L, et al (2024) Translation, psychometric testing and implementation of the perineal assessment tool for assessing incontinence-associated dermatitis risk in semi-intensive care patients. *Sci Rep* 14(1): 29787. doi: 10.1038/s41598-024-81577-7.

Tezcan B, Eraydın C, Karabacak BG (2022) Evaluating the scales used to diagnose incontinence-associated dermatitis: a systematic review. *Adv Skin Wound Care* 35(5): 1–9. doi: 10.1097/01.ASW.0000823988.56640.72.

Van den Bussche K, Verhaeghe S, Van Hecke A, Beeckman D (2018) The Ghent global IAD monitoring Tool (GLOBIAD-M) to monitor the healing of incontinence-associated dermatitis (IAD): design and reliability study. *Int Wound J* 15(4): 555–564. doi: 10.1111/iwj.12898.

Van den Bussche K, Verhaeghe S, Van Hecke A, Beeckman D (2018) Minimum data set for incontinence-associated dermatitis (MDS-IAD) in adults: design and pilot study in nursing home residents. *J Tissue Viability* 27(4): 191–198. doi: 10.1016/j.jtv.2018.10.004.

Werth SL, Justice R (2019) Prevalence of moisture-associated skin damage in an acute care setting: outcomes from a quality improvement project. *J Wound Ostomy Continence Nurs* 46(1): 51–54. doi: 10.1097/WON.0000000000000499.

Woo KY, Beeckman D, Chakravarthy D (2017) Management of moisture-associated skin damage: a scoping review. *Adv Skin Wound Care* 30(11): 494–501. doi: 10.1097/01.ASW.0000525627.54569.da.

Yates A (2020) Incontinence-associated dermatitis 1: risk factors for skin damage. *Nurs Times* 116(3): 46-50