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Assessment, Selection, Use, and Evaluation of Body-Worn Absorbent Products for Adults With Incontinence

A WOCN Society Consensus Conference

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ABSTRACT

The Wound, Ostomy and Continence Nurses (WOCN) Society charged a task force with creating recommendations for assessment, selection, use, and evaluation of body-worn absorbent products. The 3-member task force, assisted by a moderator with knowledge of this area of care, completed a scoping literature review to identify recommendations supported by adequate research to qualify as evidence-based, and area of care where evidence needed to guide care was missing. Based on findings of this scoping review, the Society then convened a panel of experts to develop consensus statements guiding assessment, use, and evaluation of the effect of body-worn absorbent products for adults with urinary and/or fecal incontinence. These consensus-based statements underwent a second round of content validation using a modified Delphi technique using a different panel of clinicians with expertise in this area of care. This article reports on the scoping review and subsequent evidence-based statements, along with generation and validation of consensus-based statements that will be used to create an algorithm to aid clinical decision making.

KEY WORDS: Absorbency, Absorbent pads, Adult diapers, Body-worn absorbent products, Daytime incontinence, Fecal incontinence, Incontinence pads, Nighttime incontinence, Product selection, Urinary incontinence.

INTRODUCTION

Despite recent advances in multiple areas of continence management including pharmacotherapy, surgery, physiotherapy, and neuromodulation, evidence suggests that use of incontinence products remains the most prevalent strategy among adults with urinary or fecal incontinence.[1-3] For example, Uchil and colleagues[1] surveyed 763 community-dwelling elder women with urinary or fecal incontinence and found that 75.7% reported using pads on a daily basis. Similarly, Subak and colleagues[2] surveyed 293 community-dwelling women with urinary incontinence, with a mean age of 56 ± 11 years and found that 74% reported daily use of pads, absorbent briefs, or pull-ups. Roe and associates[3] reported findings of a systematic review of 60 studies and reported that 92.9% of nursing home residents in the United States and 71.6% of residents in Iceland used incontinence pads or briefs on a daily basis.

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In 2009, the WOCN Society published a statement clarifying the role of the WOC nurse in continence care.[4] Though only briefly mentioned, overseeing and providing direct care related to the selection, use, and evaluation of absorbent products were identified as an essential component of this care. Despite this important acknowledgement, evidence concerning the use of absorbent products for the management of fecal or urinary incontinence remains sparse, few up-to-date resources are available that provide guidelines for the use of absorbent products, and clinical knowledge of the design and use of these products is limited.[5-7]

Absorbent Products: Principles and Design

Absorbent products are a group of disposable or reusable devices used to contain or conceal urine or stool.[5] They draw urine or liquid stool into an absorbent core until the product is changed.[6-8] Historically, these products were made from natural materials such as linens or moss that had little ability to absorb urine or liquid stool; in addition, their use was limited to infants and young children prior to the age of toilet training.[6] Reusable cloth diapers became widely used in the later 19th century; they were typically made from cotton-based materials (muslin) or linen and held in place with pins. Cloth diapers were widely used in the early 20th century. Single use, disposable diapers were introduced around 1942, closely followed by introduction of plastic coverings that ultimately evolved into the waterproof backings of modern absorbent products. During this period, the materials used in the most important component of the diaper, its absorbent core, evolved from cotton cloth to fluff pulp (natural fibers found in woods). In 1978, superabsorbent polymers which are synthetic granular polymer crystals capable of absorbing up

to 30 to 50 times their weight, revolutionized the design and manufacture of absorbent products. The first disposable products specifically designed for the management of incontinence in adults became commercially available in the 1970s.

The design of most absorbent products commercially available in the 21st century comprises 4 distinct layers.[8,9] The coverstock is the innermost layer that lies in direct contact with the user's skin. Immediately beneath that is an acquisition layer that consists of a thin, porous materials designed to rapidly transfer fluid into the absorbent core. The third layer is the absorbent core; 21st century designs usually contain multiple layers of superabsorbent polymers or fluff pulp enabling it to rapidly absorb liquid and retain it away from the skin. The outermost layer is a film barrier that resists leakage of fluid. Contemporary designs provide variable degrees of breathability, allowing airflow to the inner aspect of the product and the user's skin without compromising containment of liquid within the product. A variety of body-worn absorbent products are commercially available, including pads, briefs, and pull-ups that incorporate this 4-layer structure and are designed to be worn against the body in order to absorb and conceal urinary and/or fecal incontinence.[5,7]

The purpose of this article is to report findings of a scoping review of articles identifying knowledge and evidence-related use of body-worn products for the management of urinary and fecal incontinence and to identify gaps in current knowledge and evidence. This article also summarizes results of a conference convened to generate consensus-based statements that, when combined with the evidence-based statements generated from the scoping review, will be used to generate a decision-making algorithm for assessment, selection, use, and evaluation of body-worn absorbent products in persons with urinary and/or fecal incontinence.

METHODS

Because of the paucity of evidence in this area of care, the Task Force elected to complete a scoping rather than systematic review to identify current best evidence. A scoping review is a structured technique of searching the literature in order to identify key concepts, types of evidence, and gaps in evidence. Our review used the approach described by Levac and colleagues[10] and refined by Colquohoun and colleagues.[11] The primary aim was to identify current knowledge and clinical evidence guiding assessment, selection, and evaluation of body-worn absorbent products and to identify gaps in evidence requiring generation of consensus-based best practice statements needed to generate a decision-making algorithm for care. Results of the structured review were also used to generate levels of evidence underlying these statements using a 3-point ordinal scale adapted from a taxonomy for Statements for Recommendations for Treatment statements promulgated by the American Academy of Family Physicians and routinely used by the WOCN Society to generate similar scholarly documents.[12-14] The methodologic quality of individual studies was ranked using a 3-point scale where A indicates high quality, B indicates good quality, and 3 indicates low quality using the Johns-Hopkins Evidence-Based Practice methodology.[15]

Consistent with guidelines for scoping literature reviews, we included a wide variety of study designs including randomized controlled trials, nonrandomized comparison cohort studies, cross-sectional studies, multiple case series, single case studies, N of 1 trials, and qualitative studies. We also included studies that used healthy volunteers or in vitro techniques to evaluate product performance. In addition, we searched for and incorporated systematic and scoping reviews, clinical practice guidelines, and documents containing evidence-based recommendations for treatment such as book chapters. Exclusion criteria were articles published prior to 2000, and conference abstracts, proceedings, and other gray literature sources.

An experienced reference librarian searched 3 multidisciplinary electronic databases (September 19, 2017) to find literature related to body-worn absorbent products—CINAHL, PubMed, and Embase. These databases were selected for their robust, international scope of searchable literature. Search filters were applied to identify English language articles. Article types included Scholarly Journals for CINAHL and Articles, Articles in Press, and Reviews for EMBASE. Medical Subject Heading terms as identified in the MEDLINE database and used in PubMed were "incontinence pads," "adult diapers," "urinary incontinence," and "fecal incontinence." Additional key terms were "containment devices," "incontinence products," "absorbent products," "incontinence briefs," "male guards," "incontinence inserts," and "incontinence shields."

Selection of Articles

The initial search returned 444 results from the CINAHL database, 439 from PubMed, and 269 results from EMBASE; these 1152 citations were transferred to a proprietary citation management software. This process retrieved 422 citations for further scrutiny. An initial title review of these abstracts by 3 task force members removed 306 citations, leaving 116 for additional review. Task force members then read each article in full, resulting in the 32 sources included in this review. Following this search, we reviewed bibliographic review of selected articles in order to identify any articles missed in the electronic database search. Finally, we searched the Google search Engine and Google Scholar database (Google, Mountain View, California), US Agency for Healthcare Research and Quality National Guideline Clearinghouse, Web pages of the WOCN Society, Society of Urologic Nurses and Associates, American Urological Association, European Association of Urology, American Urogynecologic Society, Society of Urodynamics and Female Urology, International Continence Society, and International Urogynecological Association for relevant clinical practice guidelines. These searches identified 4 sources not identified in the electronic database search (Figure).

RESULTS

Our search identified 8 records that reported or summarized studies that employed in vitro techniques or healthy volunteers to evaluate product performance of body-worn absorbent products (Table 1).[16-22] The quality of these studies varied from good to low, and caution is needed when attempting to apply this evidence to clinical decision making.

Two studies evaluated absorbent properties of body-worn absorbent products. Yamasato and colleagues[17] evaluated leak volumes (defined as the volume of fluid instilled when loss of fluid from the absorbent product occurs) in 12 commercially available absorbent pads or briefs and found considerable variability between products and among products within the same category. Nevertheless, they found that brand name products tended to perform better than generic products, and products designed for moderate to heavy incontinence had greater absorbent capacity than products designed for light

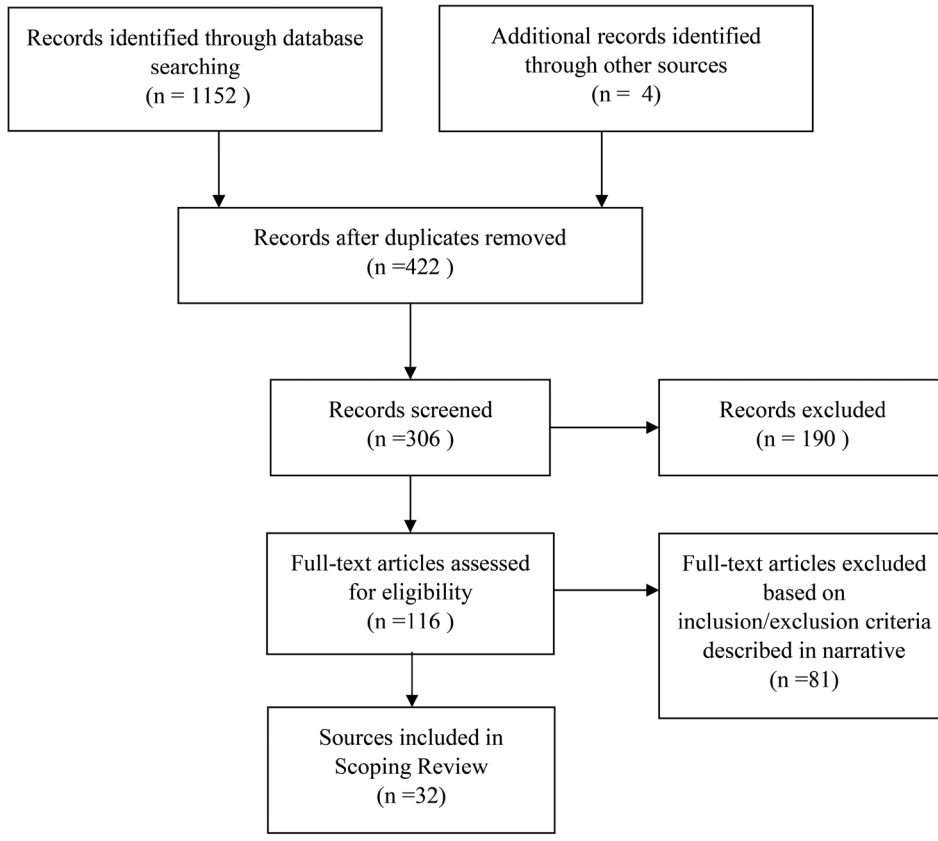

Figure. PRISMA flow diagram.

incontinence. Erekson and colleagues[19] compared 7 commercially available pads or briefs using a wetback technique and reported broadly similar findings. They also reported variability between types of designs and among products within the same category, and they also found that brand name products tended to outperform generic products. Considered collectively, findings from these studies demonstrate clinically relevant variability in performance among commercially available products and the need to differentiate quality of individual products based on their performance in the laboratory and clinical setting. This evidence also indicates that selection of body-worn absorbent products for formulary use requires the same level of expertise WOC nurses currently apply to ostomy and wound care products.

Four studies were identified that evaluated the magnitude of transfer and effect of various skin protectants on urine absorption.[16,18,20,21] Findings from these studies consistently suggest that cyanoacrylate-based skin protectants exert the least adverse effects on absorption. Evidence further suggests that creams and ointments exert deleterious effects on the liquid acquisition rate of absorbent products, and the greatest effects may be exerted by petrolatum-based ointments. However, Fleming and colleagues[18] noted that the degree of transfer of a particular skin protectant was not strongly correlated with its impact of fluid absorption rates. Additional research is this area is clearly indicated, and findings from these studies must be evaluated in the clinical setting before firm conclusions can be reached.

Finally, we identified a single study that evaluated differences in tissue interface pressures when an anthropometric dummy was placed naked or wearing a body-worn absorbent product on a standard, viscoelastic, and cut foam support surface. Fader and colleagues[22] found that placement of a body-worn absorbent product on the dummy raised interface pressures 20% to 25% when compared to placement without clothing. They reported that wetting the product with 200 mL of fluid had no impact on these pressures. Instead, they observed that folds in the absorbent brief created the highest interface pressures, and they found that these pressures could be lowered by smoothing the absorbent product. While these findings are interesting, additional research in healthy volunteers is needed to evaluate the influence of wetting with higher volumes of fluid on tissue interface pressures and the impact of various types of absorbent products including underpads versus body-worn products on immobile patients in the acute and critical care settings.

A single guideline was identified and read in full that provides guidelines for performance standards of disposable absorbent products.[23] Recommendations were generated using a nominal group process, a structured methodology that incorporated clinicians, commercial stakeholders, consumers, a lay caregiver representative, and a professional society delegate to build consensus around a common problem (in this case performance of disposable absorbent products).[24] The group generated 9 recommendations that provide minimum performance standards for absorbent products based on outcomes beyond total absorption capacity. The total absorption capacity is the primary parameter used to measure performance of absorbency; it has been standardized by the International Organization for Standardization (ISO, 15621:2017), the most widely used standard by manufacturers of these products.[25] These recommendations are based on 9 variables: 1) rewet rate, 2) rate of liquid acquisition, 3) retention capacity, 4) sizing

TABLE 1.
Product Evaluations Studies Using In Vitro Techniques or Healthy Volunteers

Study and Design	Study Design Subjects	Key Findings	Study Quality Grade
Dykes and Bradbury, (2016)[16] Randomized controlled trial	Compared fluid absorption following application of 5 skin protectants (1 cream-based, 2 ointment-based, 2 cyanoacrylates) to volar surface of forearm exposed to synthetic urine and covered with modified absorbent pad applied for 5-min period of time; results were compared to a 6th site not exposed to a skin protectant 20 healthy volunteers, mean age of 45 y	All sites treated with a skin protectant exhibited significant transfer of product onto the modified absorbent pad when compared to the control site. No statistically significant differences in product transfer or absorption of synthetic urine were found when the cream, ointment, or cyanoacrylate-based products were compared. Significant differences were noted when synthetic urine absorption rate was found when an ointment-based product with bioadhesives was compared to the control site. No statistically significant differences were found when synthetic urine absorption was found when the 2 cyanoacrylate, 1 cream-based, and 1 ointment-based skin protectants were compared to the control site.	C
Yamasoto et al (2014)[17] In vitro study	Compared leak point volumes and cost-effectiveness of 12 absorbent pads or briefs classified as moderate absorbent pads, maximum absorbent pads, maximum absorbent briefs; products randomly selected from pack bought at local retail stores No human subjects Leak point volumes measured using flow rate of 15 mL/s Cost-effectiveness analysis based on maximum retail price versus leak point volume	Maximum absorbent pads and briefs had higher mean leak point volumes than moderate absorbent pads Statistically significant differences were found in leak point volumes in all maximum absorbent pads and briefs but not in moderate absorbent pads Analysis of cost-effectiveness based on leak point volumes indicated that briefs are more cost-effective than moderate and maximum or moderate absorbent pads	B
Fleming et al (2014)[18] Randomized controlled trial	Compared transfer and absorption of synthetic urine in 4 cream-based skin protectants (3 silicone-based, 1 zinc-oxide based) applied to the volar surface of the forearm and covered by 2 modified absorbent pads (moderate and maximum absorbency) for period of 5 min; results were compared to a 5th site not exposed to a skin protectant 3 healthy volunteers, mean age of 37 y	All skin protectants demonstrated evidence of transfer to modified absorbent pad when compared to control Synthetic urine absorption differed significantly when compared to control for all the cream products tested; the magnitude of this effect was small (8% reduction in absorbent capacity) No significant differences were found when creams were tested using a modified pad with maximum absorbency The degree of cream absorbed was not significantly correlated with the effect on synthetic urine absorption	C
Erekson et al (2008)[19] In vitro study	Comparison of 2 pads designed for light UI, 3 pads designed for moderate/heavy UI, 2 absorbent briefs designed for moderate/heavy UI using wetback technique (USA/T2/7-2); wetback was measured at 30 s and 5 min after 5 mL and 50-mL leak volumes; measurements were repeated 3 times 2 human subjects, 1 with BMI <20 and 1 with BMI >40, completed wetback testing; mean age or age range not reported	Product within each of the categories varied Brand name products performed better on the wetback testing than generic products	C
Zehrer et al (2005)[20] Randomized controlled trial	Compared 3 petrolatum-based skin protectants to the volar surface of the forearm, covered with modified absorbent brief and exposed to synthetic urine for 5 min; exposure using block randomization technique 16 healthy volunteers, age range: 18-45 y	3 Petrolatum-based skin protectants transferred to a modified absorbent brief applied to the volar surface of volunteers' forearms and exposed to synthetic urine solution for period of 5 min; no control site described Petrolatum-based ointments were more significantly more likely to transfer to the absorbent product (59%-69% per weight) and to reduce fluid absorption (54%-90%) than was the cyanoacrylate protectant	C
Bolton et al (2004)[21] Randomized controlled trial	Compared 3 skin protectants (all were creams) to the volar surface of the forearm, covered with modified absorbent brief and exposed to synthetic urine for 5 and 120 min; exposure applied using block randomization technique 12 healthy volunteers, mean age or age range not identified	No inferential analysis used to analyze differences in transfer or urine absorption	C
Fader (2004)[22] In vitro study	Single anthropometric dummy designed to mimic body dimensions of 70-kg (154 lb) adult placed on standard foam hospital mattress, viscoelastic foam mattress, and surface cut foam mattress naked (control), wearing a dry disposable adult absorbent brief and the same absorbent brief wet with 200 mL of saline applied at a rate of 3-5 mL/s No human subjects	Adding an incontinent brief to the anthropometric dummy significantly increased interfaces pressures (magnitude: 20%-25%) Interface pressures did not differ when dry absorbent brief was compared to brief wet with 200 mL Folds observed in the briefs corresponded with peak interface pressures and smoothing folds by hand significantly reduced these pressures	B

Abbreviations: BMI, body mass index; UI, urinary incontinence.

and sizing options, 5) absorbency levels, 6) safety, 7) presence of a closure system, 8) breathable zones, and 9) elasticity.[23]

Clinical-Based Articles and Resources

Two book chapters were retrieved—1 from the 6th edition of a textbook from the International Consultation on Incontinence and the International Continence Society, and 1 from the WOCN Society's Core Curriculum series.[5,7] Cottenden and colleagues[7] completed a comprehensive review of research related to clinical use of various continence products including bedside commodes, urinals, bedpans, absorbent products, indwelling and intermittent urinary catheters, and indwelling devices for fecal incontinence. Evidence was summarized using ordinal ranking systems and recommendations for both clinicians and consumers were generated based on this evidence. Wilde and Fader[5] provided guidance to students and practicing WOC and continence nurses concerning use of various absorbent products, including body-worn products, in this academic textbook that serves as the Core Curriculum for Wound, Ostomy and Continence specialty nursing practice.

Three systematic reviews were identified and retrieved—2 are systematic reviews with meta-analysis from the Cochrane Database of Systematic Reviews and 1 is a Health Assessment Technology Assessment for the National Health System of the United Kingdom.[25-27] Fader and colleagues[25] reported findings of a systematic review of body-worn absorbent products in women with light urinary incontinence. They identified only 1 study with 85 participants that met inclusion criteria; findings from this study were also reported as part of the Health Assessment Technology Report.[26] This randomized crossover trial of 85 community-dwelling British women who tested 3 products from 4 product categories (disposable pads, disposable menstrual pads, reusable pants with integral pad, and reusable pads with washable inserts). Findings were based on product performance parameters (leakage, remains in place, smell, discretion, dry and wet comfort, skin dryness, and overall opinion when worn day and night). They found that disposable pads were most commonly used for light incontinence, and products in this category were better for leakage and other variables than alternative designs including washable or menstrual pads. Nevertheless, some women preferred menstrual pads which were less expensive.

Fader and colleagues[27] also reported findings from a systematic review and meta-analysis of body-worn absorbent products for women and men. Two studies enrolling 185 subjects met inclusion criteria. Similar to the Cochrane Review reports mentioned previously, data from this study were reported as part of the Health Assessment Technology Report.[26] The first was a randomized crossover trial of 49 community-dwelling women and 36 men who used 4 disposable body-worn absorbent products (disposable inserts held in place with a mesh brief, disposable briefs, T-shaped diaper, pull-ups) and 1 reusable brief. The second was a randomized crossover trial of 73 women and 23 men who were able to complete questionnaires evaluating the same performance parameters described for community-dwelling women.[26,27] Analysis revealed that no single design was superior to other designs. Nevertheless, they reported clinically relevant differences based on gender and more subtle differences based on residence (community vs nursing home). Men living in the community or nursing home experienced higher volume urine loss with a given episode of incontinence and tended to use more products per day than did women. They preferred the performance of disposable briefs over pads held in place by a mesh brief. They did not report significant differences in the performance of the disposable brief versus T-shaped diaper, but briefs were less costly. Community-dwelling women preferred disposable pull-ups, but women residing in nursing homes preferred disposable briefs at night. A minority of community-dwelling women indicated a preference for reusable briefs based on cost, and a minority of men preferred reusable briefs at night based on cost.

Considered collectively, pooled findings from these studies provide the best evidence concerning performance and preferences of users of body-worn absorbent products. Nevertheless, the generalizability of these findings is limited when applied to our goal of generating a decision-making algorithm for clinicians practicing in North America. Limitations to generalizability included the paucity of studies identified (n = 3), the small pooled sample sizes from these 3 studies (pooled samples = 85 and 185, respectively), lack of diversity in study settings, age of the studies, and differences in health care delivery systems (predominantly national health system vs predominantly private insurance-based system).

The scoping review also retrieved 21 individual studies that met inclusion criteria (Table 2). We identified 10 studies that evaluated performance parameters of body-worn absorbent products in users of these products.[1,28,31,33,34,41-45,48] Several reported an overall assessment of use of body-worn absorptive products to manage incontinence.[1,34,41] The proportion of users indicating that they were satisfied, pleased, or delighted with use of body-worn products varied from 39% to 67%; the proportion of users who indicated overall dissatisfaction with body-worn absorbent products varied from 32% to 33%.

Getliffe and coworkers[43] interviewed community-dwelling women and identified the characteristics they used to evaluate performance of body-worn absorbent products; they were: containing urine and related smells, discreetness when worn under clothing, likelihood of staying in place, wet comfort, and dryness of skin in contact with the product. Fader and colleagues[33] evaluated performance of 4 categories of absorbent products in adults with moderate to heavy incontinence using a validated questionnaire based partly on Getliffe and colleagues'[43] findings that addressed multiple aspects of performance. Fader's group found that absorbent product users preferred to purchase more than 1 type of product to meet individual needs For example, participants reported purchasing different product for use at home versus use while away from home and day versus nighttime use. Gender also influenced preferences; men found that disposable pads held in place with a mesh brief performed poorly. In contrast, women preferred disposable pull-ups and they were more accepting of a pad held in place with closely fitting underclothing. Budget was found to influence product choice, but 91% expressed willingness to pay additional costs to obtain absorbent products with superior performance. Fader and colleagues[45] also evaluated 14 brands of body-worn absorbent products in men with light urinary incontinence-based weight testing and found variability in some brands within the same category. Nevertheless, absorbent pouch performance was consistently ranked low when compared to other designs. In contrast, a single brand of leaf (shield) ranked significantly higher than all other products evaluated.

We found 3 studies that reported the effect of various body-worn absorbent products on incontinence-associated dermatitis (IAD). Clarke-O'Neill and coworkers[31] reported findings from a crossover randomized controlled trial that evaluated

TABLE 2.
Studies Involving Users, Lay, and Professional Caregivers of Persons Using Body-Worn Absorbent Products

Study and Design	Study Design Subjects	Key Findings	Study Quality Grade
Bliss et al (2017)[28] Randomized controlled trial	Compared skin of the volar surface of the forearm and inner thighs or nursing home resident covered with modified (cut) absorbent brief with spiral fiber technology to standard brief under different conditions: no cover (control), covered with dry standard of spiral fiber brief, covered with standard or spiral fiber brief wet with an alkaline solution N = 26 M age: 87 y F:M ratio: 20:6 Setting: Nursing home in Midwestern United States	Skin covered with a modified absorbent brief and left dry or wet with an alkaline solution with spiral fiber technology had significantly lower pH than skin covered with a standard brief (inner thigh M =5.7 vs 6.4; Forearm 5.3 versus 6.0; $P < .01$)	B
Fernando and Wagg (2017)[29] Cross sectional survey	Compared responses of hospitalized older adults and direct care providers concerning acceptable wait times before changing absorbent products following occurrence of a urinary or fecal incontinent episode N = 50 M age: 79.1 y F:M ratio: 42:8 Direct care providers N = 50 RN: 66% LPN: 24% Nursing assistants: 10% Setting: Tertiary care hospital in Western Canada	Significant differences in acceptable wait time following urinary incontinence were reported by patients versus direct care providers (M: 38 vs 85 min, $P < .001$) No significant differences were found in acceptable wait times following a fecal incontinence episode (M: <15 min) Tolerance of any soiling was significantly higher in patients who were prior residents of care facilities (OR = 6.2; 95% CI, 1.3-28.1), previously used incontinence products (OR = 2.0; 95% CI, 1.0-3.8), or used walking aids (OR = 4.0; 95% CI, 1.1-14.7)	C
Sacco et al (2017)[30] Nonrandomized clinical trial	Users of absorbent products identified from 5 continence care centers identified absorbent product use at baseline, prospectively completed a 48-h pad weight test and bladder diary, results were analyzed for "appropriateness" by continence care providers based on the maximum absorbent capacity of the product versus the recorded frequency and volume of urine loss N = 13,942 M age: 78 y F:M ratio 10,725:3768 Setting: Five health districts in Italy	60% of absorbent products used at baseline deemed inappropriate; 75% were found to absorb more urine than leakage measured by bladder diary and pad weight measurement Multivariate regression analysis found that propensity to inappropriate pad use was associated with male gender, lower level of activity and mobility, need for assistance, lower mean pad weight gain (<500 mL), and unhealthier skin status	C
Clarke-O'Neill et al (2015)[31] Randomized, multiple crossover trial	Compared severity of IAD among nursing home residents using 4 body-worn absorbent products (disposable brief, disposable pad held in place with stretch brief, disposable pull-ups, disposable T-shaped diaper) N = 78 M age: 82.7 y F:M ratio: 57:21 Setting: 10 nursing homes in London and Southern England	No differences in incidence of severity of IAD based on pad design.	B

(*continues*)

TABLE 2.

Studies Involving Users, Lay, and Professional Caregivers of Persons Using Body-Worn Absorbent Products (*Continued*)

Study and Design	Study Design Subjects	Key Findings	Study Quality Grade
Teerawattananon et al (2015)[32] Nonrandomized clinical trial	Provided access to disposable absorbent briefs to community-dwelling persons aged 15 y and older N = 90; 71 completed trial; 22% dropout rate M age: 49 y F:M ratio: 50:40 Setting: 2 rehabilitation centers in Thailand	HRQOL and independence in performing activities of daily living improved significantly by week 10 after beginning use of disposable absorbent briefs, M difference at 10 wk: 0.012 (95% CI, 0.046-0.158) and M difference at 10 wk: 4.40 (95% CI, 1.74-7.07) respectively, $P < .05$ Prevalence of pressure injuries decreased significantly at week 10, 67% decline, 95% CI, 16%-78%, $P < .05$	C
Fader et al (2014)[33] Prospective descriptive study	Community-dwelling adults tested 4 product categories (disposable pads held in place with mesh briefs, disposable adults briefs, belted T-shaped diapers, disposable pull-ups) and selected preferences based on a range of selected budgets N = 85, 75 completed trial, 12% dropout rate M age: 52.8 y F:M ratio: 36:49 Setting: England	When faced with a specific budget, subjects preferred to use multiple designs for varying needs Disposable pads held in place with mesh briefs were ranked lowest by men and second to pull-ups by women 91% indicated that they were willing to pay above budget to obtain preferred design	B
Bliss et al (2011)[34] Cross-sectional survey	Queried community-dwelling adults with fecal incontinence about use of body-worn absorbent products N = 189 M age: 66 y (users); 51 y (nonusers), $P = .03$ F:M ratio: 76:10 (users); 69:34, $P = .009$ Setting: Midwestern United States	45% of respondents used absorbent products to manage incontinence Respondents who used absorbent products had higher fecal incontinence severity scores than those who did not use these products (median 4.75; $P = .006$) More respondents reported using feminine hygiene pads as compared to disposable incontinence pads (38% vs 20%) 50% of users were satisfied with the product they currently used	C
Denat and Korshid (2011)[35] Randomized controlled trial	Compared disposable adult brief to anal pouch on occurrences and time to onset of IAD in hospitalized adults N = 30 M age: 71.46 (anal pouch users) vs 68.73 (disposable absorbent brief users); P = NS F:M ratio: 18:12 Setting: Tertiary care hospital in Turkey	IAD occurred in significantly more patients using disposable absorbent briefs versus the anal pouch (100% vs 67%, $P = .04$) The onset of IAD occurred later in subjects allocated to management with a perianal pouch (M: 6.4 vs 3.8 d, $P = .011$)	B
Zisberg et al (2011)[36] Prospective, descriptive study	Described types of continence products used by adults ≥70 y upon admission to hospital; analyzed the association between use of continence products and new onset of urinary incontinence following hospital discharge N = 352 M age: 78 y F:M ratio: 147:205 Setting: Tertiary care hospital in Israel	16.5% used disposable absorbent briefs during their hospital stay Persons who used absorbent briefs were more likely to experience new onset of urinary incontinence than were patients who voided independently during their hospital course, OR = 2.62 (95% CI, 1.17-5.87)	B
Zisberg (2011)[37] Prospective, descriptive study	Measured the incidence of disposable absorbent briefs use in older adults admitted to hospital use among older patients who did not use diapers prior to admission, analyzed factors associated with the use of absorbent briefs N = 465 M age: 78 y F:M ratio: 222:243 Setting: Tertiary care hospital in Israel	14% of patients who vided independently used absorbent briefs during their hospital course The relative risk (RR) of absorbent brief use versus self-toileting was 18.76 (95% CI, 4.36-43.72) for older adults admitted to hospital with an acute illness Patients who used absorbent briefs were more likely to be female (RR + 1.65; 95% CI, 1.20-2.23) and they were more likely to have impaired mobility (RR = 1.59; 95% CI, 1.10-2.35)	C

(*continues*)

TABLE 2.
Studies Involving Users, Lay, and Professional Caregivers of Persons Using Body-Worn Absorbent Products (*Continued*)

Study and Design	Study Design Subjects	Key Findings	Study Quality Grade
Zurcher et al (2011)[38] Cross-sectional descriptive study	Measured proportion of a group of adult patients admitted to hospital indicating a history of urinary incontinence, measured nursing recognition of urinary incontinence, and interventions used to manage incontinence via review of medical records N = 78, 41 incontinent of urine, 37 continent M age: 76 y (incontinent), 74 y (continent), *P* = NS F:M ratio: 30:11 (incontinent), 23:14 (continent) Setting: Swiss hospital	41 (51%) of patients indicated a history of urinary incontinence; nursing notes indicated incontinence in 10 (24)% Use of body-worn absorbent products or underpads was the only intervention for the management of urinary incontinence documented in nursing notes	C
Chartier-Kastler et al (2011)[39] Randomized crossover trial	Compared preference and HRQOL in adult males using body-worn absorbent products versus external collection device (condom catheter) N = 61, 51 completed trial, 17% dropout rate M age: 66.8 y All patients were male Setting: Community-dwelling men cared for in 14 urologic centers in France	Scores on all dimensions of a condition-specific instrument (King Health Questionnaire) were significantly lower in men randomized to the external collection device indicating better HRQOL 69% indicated that they preferred the external collection device to use of body-worn absorbent products	C
Omli et al (2010)[40] Secondary analysis of data from prospective cohort study	Analyzed association between number of absorbent products used per day and UI severity, analyzed association between use of absorbent N = 153 M age: 85 y (females), 81 y (males) F:M ratio: 105:48 Setting: Norwegian nursing homes (number not specified)	Residents who used absorbent products (product category not specified) were more likely to experience a symptomatic urinary tract infection over a 12-mo period than were residents who did not use absorbent products vs 11%; *P* = .001	C
Teunissen and Lagro-Janssen (2009)[41] Cross-sectional descriptive study, data collection via survey and interview	Described proportion of community-dwelling adults using body-worn absorbent products, use during waking hours, during sleep or both, type of products used, and analyzed difference in usage patterns based on gender N = 370 M age: 71 y F:M ratio: 314:56 Setting: Adults receiving care in Nijmegen, the Netherlands	87% of women versus 15% of men reported using body-worn absorbent products 80% of women wearing body-worn absorbent products used them during the day and 40% used absorbent products during waking hours and during sleeping hours 50% of men used body-worn absorbent products during waking hours and 50% reported using them both while awake and asleep 67% of women and 50% of men were satisfied with the absorbent products they regularly used Regression analysis found that severity of incontinence was positively correlated with the use of body-worn absorbent products in both women and men	C
Bliss and Savik (2008)[42] Cross-sectional survey	Community-dwelling adults provided a butterfly-shaped surgical dressing to be placed over the anus and between the buttocks for containment of fecal incontinence N = 36 M age: 51 y F:M ratio: 16:20 Setting: Midwestern United States	28/36 (78%) of respondents given the surgical dressing reported fecal incontinence, 26 (96%) reported using the body-worn absorbent product and 85% continued to use the device 52% of users wore 1 or more dressings daily; 30% wore 1 while sleeping 30% wore the dressing a few times per week (median: 3 pads per week) The anorectal dressing was preferred to a pad or panty liner by 92% of respondents	C
Getliffe et al (2007)[43] Nonrandomized crossover trial, follow-up data collected via interview	Evaluated characteristics of body-worn absorbent products that characterize effectiveness in women users N = 99 M age: not stated All subjects were women	5 body-worn absorbent product characteristics ranked most important for day time use: to hold urine, to contain smell, to stay in place, discreteness, and wet; and wet comfort 5 body-worn absorbent product characteristics ranked most important for nighttime time use: to hold urine, to contain smell, to stay in place, discreteness, and wet; and skin dryness Poor containment of urine and smell, lack of discreteness, and need for complex regimes for pad management provoked anxiety and negative perceptions of pad performance	B

(*continues*)

TABLE 2.
Studies Involving Users, Lay, and Professional Caregivers of Persons Using Body-Worn Absorbent Products (*Continued*)

Study and Design	Study Design Subjects	Key Findings	Study Quality Grade
Palese et al (2007)[44] Prospective, observational study	Measured the incidence of absorbent product use in adult patients admitted to hospital N = 396; follow-up data obtained on 195 M age: 76.8 y F:M ratio: 225:171 Setting: Hospital in Northern Italy	276 (69.7%) were continent on hospital admission; 120 (30.3%) reported incontinence and use of body-worn absorbent products 98 participant patients who indicated that they were continent prior to hospital admission were managed with absorbent products during their hospital course (M: 9.3 d), 75% began use on the day of admission, and an additional 16% began use on days 2-3 of admission 15/26 patients (57%) continued use of body-worn absorbent products (mean time of follow-up not specified)	C
Fader et al (2006)[45] Randomized crossover trial	Compared 14 different brands of 4 design categories of body-worn absorbent products designed for light urinary incontinence in men (disposable pouches/shields, leafs/guards, reusable pad/pant, disposable pad), subjects were community-dwelling men with light incontinence based on pad weight testing; product performance based on scores of validate questionnaires N = 74 Median age: 70 y All subjects were men Setting: England	Pouch performance was ranked as poor by users; little variability in product performance was noted when brands within this category were compared Absorbent leaf, reusable pad/pant, and disposable pads designs performed significantly better than the pouch ($P < .01$) One brand of leaf performed significantly better than all other designs and other brands within that category ($P < .001$)	B
Uchil et al (2006)[1] Cross-sectional survey	Community-dwelling adult women described reasons for using body-worn absorbent product use and satisfaction with their use N = 763 M age: not reported All subjects were women Setting: South London	88% of women who used body-worn absorbent products reported urinary incontinence 44% of women who used body-worn absorbent products reported fecal incontinence The reason for pad absorbent product use was not clear in 4.3% 53.2% indicated use of body-worn absorbent product for more than 3 y 39% claimed that they would be delighted, pleased, or mostly satisfied with the use of absorbent products, 29.1% indicated mixed feelings, and 31.9% indicated that they were mostly dissatisfied, unhappy, or felt terrible about continues use 27.7% indicated interest in seeking professional care for their incontinence	C
Tarbox et al (2004)[46] N of 1 trial	N of 1 trial using withdrawal design, followed by restoration of regular use of absorbent brief for urinary incontinence in cognitively impaired adult N = 1 Age: 29 y Subject was male Setting: Western United States	Withdrawal of regular use of disposable adult brief decreased involuntary voids.	C
Langa et al (2002)[47]	Compared weekly hours spent providing informal care to community-dwelling adults aged ≥70 y who were continent, incontinent and did not use absorbent products, and incontinent who used body-worn absorbent products N = 7,443, 5988 (continent), 707 (incontinent, no absorbent product use), 733 (incontinent, used absorbent products) M age: 77.2 (continent); 78.1 (UI, no pad use); 79.3 (UI, pad use) F:M ratio 59:4 Population-based sample from across the United States	Continent men received an average of 7.4 h/wk of care, incontinent men who did not use pads averaged 11.3 h of care, and incontinent men who used pads received an average of 16.6 h/wk ($P < .01$); women in these groups received an average of 5.9, 7.6, and 10.7 h of care weekly ($P < .01$) Cost analysis revealed that additional costs of informal care associated were $4000 for incontinent men who used body-worn absorbent products and $2000 for women who were incontinent and used body-worn absorbent products	A

Abbreviations: CI, confidence interval; F:M ratio, ratio of female to male subjects; HRQOL, health-related quality of life; IAD, incontinence-associated dermatitis; M, mean; NS, not significant; OR, odds ratio; UI, urinary incontinence.

IAD in 78 nursing home residents using 4 designs; no significant differences were found when IAD occurrences were compared.

Beguin and colleagues[48] combined in vitro techniques, studies in healthy human volunteers, and a multiple case series in an evaluation of an absorbent brief with a curled, citric acid cross-linked cellulose fiber technology. In vitro testing showed that this technology reduced pH at the surface and within the absorbent core of the brief when compared to an absorbent brief without this design feature. Bliss and colleagues[28] evaluated the influence of this technology using the skin of the forearms and inner thighs of 26 nursing residents and reported significantly lower cutaneous pH when the brief was applied dry, wet with water, or wet with an alkaline solution. Beguin and colleagues[48] also reported findings from a multiple case series of 12 elderly adults cared for in a nursing home or rehabilitation facility; 75% experienced resolution of IAD over a 21-day period. While these findings are promising, a randomized controlled trial is needed to evaluate the efficacy of this technology on prevention and treatment of IAD.

Two studies specifically evaluated the use of body-worn absorbent products in patients with fecal incontinence. Bliss and associates[34] evaluated absorbent product use in community-dwelling adults and found that nearly half (45%) used these products. Analysis revealed that absorbent product users had more severe fecal incontinence but many reported use of feminine hygiene or other products not specifically designed for fecal incontinence. Bliss and Savik[42] also reported an evaluation of community-dwelling adults provided with a butterfly-shaped dressing used for light fecal incontinence. Ninety-six percent of postoperative adults with fecal incontinence reported using the device and 85% continued its use. A significant majority (92%) indicated that they preferred this product to absorbent pads of panty liners. The majority of body-worn absorbent products are designed for containment of urinary incontinence, but findings from these studies emphasize the importance of additional research and development of products specifically designed to meet the needs of persons with fecal incontinence.

We retrieved 2 studies that compared body-worn absorbent products to other types of incontinence produces. Chartier-Kastler and colleagues[39] compared satisfaction and several dimensions of health-related quality of life in community-dwelling men randomly allocated to the use of an external collection device (condom catheter) versus self-selected body-worn absorbent products and reported higher satisfaction with the external collection device. Denat and Korshid[35] compared IAD occurrences and time to onset in acutely ill adults with diarrhea and fecal incontinence randomly allocated to use of disposable absorbent briefs versus an anal pouch. Subjects allocated to the anal pouch were less likely to develop IAD and experienced a later onset of IAD when compared to those allocated to absorbent briefs. Findings from these studies reinforce the variety of continence products available for containment or diversion of fecal or urinary incontinence and the need to select the best product with the same care and knowledge base WOC nurses apply when counseling patients and their caregivers about ostomy pouching systems or topical wound care products.

Four studies were retrieved that evaluated the effect of use of body-worn absorbent products on urinary continence. Three studies evaluated the effect of regular use of absorbent products upon admission and following discharge from an acute care facility.[36,37,44] While none were designed in a manner capable of demonstrating cause and effect, all found associations between use of absorbent products and an increased likelihood of incontinence or continued use of these products following hospital discharge. In addition, an N of 1 trial study in a young adult with cognitive impairment found that withdrawal of absorbent briefs reduced the frequency of involuntary voids.[46]

Considered collectively, findings of these studies appear to suggest that absorbent products may be a risk factor for incontinence, and refraining from use of these products may alleviate or resolve incontinence. However, this observation must be carefully weighed against the culture of continence present in many acute- and long-term care facilities characterized by widespread use of absorbent products rather than targeted use based on careful assessment. Zurcher and coinvestigators[38] evaluated nursing recognition of urinary incontinence via their written documentation and interventions used for its management. They reported that nurses identified incontinence in 24% of patients who reported its presence when specifically queried about urinary leakage; analysis also revealed that use of absorbent products was the only intervention used to prevent or manage incontinence. Fernando and Wagg[29] reported results of a cross-sectional survey that compared perceptions of patients and direct care producers (RN, licensed practice or vocational nurses, and nursing assistants) on wear time following a urinary or fecal incontinence episode. They reported clinically significant differences in acceptable wait times following urinary incontinence episodes.

We assert that findings from these studies suggest that presence of incontinence upon admission to hospital is often unrecognized and many clinicians rely exclusively on absorbent products rather than assisted toileting or a variety of alternative strategies. Whether this creates a culture that paradoxically promotes overuse of absorbent products and fecal or urinary incontinence deserves additional study. We further assert that these findings emphasize the need to establish policies concerning selection and use of body-worn absorbent products rather than the more casual approach often used when delivering this important aspect of patient care.

In contrast to these findings, Teerawattananon and coworkers[32] reported positive impact of the use of body-worn absorbent products when made available to vulnerable patients receiving care from community-based rehabilitation centers in Thailand. Findings from this study serve as an important reminder of positive aspects of these products including enhanced personal dignity, increased ability to interact with others while containing and concealing incontinence, and higher health-related quality of life.

In addition to identifying gaps in evidence needed to generate consensus-based statements needed to construct a clinical algorithm, results from the scoping review were used to generate evidence-based statements needed for construction of an algorithm for assessment, selection, use, and evaluation of body-worn absorbent products. Thirty-eight statements were generated that were supported by level A or B evidence (Table 3). These statements were provided to the Consensus Panel, but they were not submitted to the formal consensus process and subsequent validation used for statements based on level C evidence.

CONSENSUS CONFERENCE

Given the significant gaps in evidence revealed by the scoping review, a Consensus Conference was held in Philadelphia,

TABLE 3.
Evidence-Based Statements

Statement	Level of Evidence
Women with light urinary incontinence	
Disposable inserts are recommended as the most effective and preferred absorbent product for women with light urinary incontinence.	B
Menstrual pads or washable pants may be sufficient for some patients with very light urinary incontinence and are cheaper.	B
Washable inserts are not recommended for women with light urinary incontinence.	B
Combinations/mixes of designs for different situations (eg, disposable inserts for going out, washable pants with integral pad for staying at home) are likely to provide optimum management in terms of patient needs and cost-effectiveness, and product advice and provision (where purchased by institutions/services) should reflect this.	B
Men with light urinary incontinence	
Disposable leafs are recommended as the most acceptable and effective design for men with light incontinence, but some men prefer other designs which should be considered as alternatives.	B
Simple insert pads are cheaper and may be acceptable to some men with light urinary incontinence.	B
Washable pants with integral pad are likely to be most suitable for men with very light incontinence who have difficulties keeping an insert or pouch in place.	B
Disposable absorbent products—as opposed to male devices—are recommended for nighttime users with postprostatectomy incontinence.	B
Women and men with moderate/heavy urinary incontinence	
Gender should be considered when products are prescribed/purchased for users. As men often have substantially higher incontinent urine volumes than women, men may require more products and/or more absorbent products than women.	B
Gender should also be considered when products are prescribed/purchased for users because men and women are likely to prefer different designs. Men generally prefer disposable diapers to inserts.	B
Women generally prefer disposable pull-ups to other designs, but these are expensive. Disposable inserts are a cost-effective alternative.	B
Caution is recommended if washable designs are being considered. Heavy bulk confines their use mainly to the nighttime (where they may be particularly useful for users who lie on their side). They are unacceptable for most people during the daytime and for most women at any time, and for this reason, a blanket policy of health services providing washables alone is not recommended.	B
Freedom from leakage: Where possible, international standard laboratory tests should be used to rank the likely leakage performance of different pads for heavy and light incontinence.	B
In general, diapers should be selected in preference to inserts to minimize leakage.	B
When products are applied by a caregiver to a patient who can stand for pad changing, disposable inserts or pull-ups are easier and quicker to change than diapers or T-shaped diapers. If the patient is lying down (eg, at night) pull-ups should be avoided.	B
Combinations of designs for different situations (eg, disposable inserts for staying in, disposable pull-ups for going out, washable diapers at night) are likely to provide optimum management in terms of patient needs and cost-effectiveness.	B
Product performance	
Findings from 2 in vitro studies of commercially available body-worn absorbent products, including inserts for light incontinence, pads inserted into tight-fitting underwear, pull-ups, and disposable briefs indicate that pad weight, category (marketed for light vs moderate to heavy incontinence), or price did not significantly influence product performance.	C
Body-worn absorbent briefs with a spiral fiber design lower cutaneous pH in healthy volunteers, even when wet with an alkaline substance.	B
Evidence concerning the effect of leave-on-skin products such as skin protectants when applied to the skin underneath a body-worn absorbent product is mixed; findings from 1 in vitro study and 2 studies in healthy volunteers suggest that some products may clog absorbent products and impair liquid acquisition, while others appear to exert little effect on liquid acquisition.	C
Product performance: Light UI in women	
Findings of a qualitative study of women with light urinary incontinence indicate that the most important characteristics when using a body-worn absorbent product during the day are its ability to hold urine, contain smell, stay in place, discreteness when worn under clothing, and comfort when worn wet ("wet comfort").	C
In women with light incontinence, inserted, disposable pads designed for containment of urine are less likely to leak and are ranked higher by users than a disposable insert (menstrual pad) and reusable underwear designed to hold the pad.	B
In a qualitative study of women with light urinary incontinence, respondents indicated that the most important characteristics when using a body-worn absorbent product during hours of sleep were its ability to hold urine, contain smell, stay in place, and keep the skin dry.	C
Product performance moderate/heavy UI in women and men	
In women and men with moderate to heavy incontinence, disposable products were less likely to leak and were preferred over reusable products.	A

(*continues*)

TABLE 3.
Evidence-Based Statements (*Continued*)

Statement	Level of Evidence
Product performance satisfaction	
Findings from a mixed-methods study (cross-sectional survey, nonstructured interview) indicated that men are less likely to be satisfied with the use of body-worn absorbent product than women.	C
Design	
Findings from a mixed-methods study of community-dwelling women and men found that half used products not specifically designed for incontinence containment.	C
Design: Cost	
Cost influences product selection.	A
Design: Day versus night	
Users of body-worn absorbent products tend to use different products day versus night and when going out versus remaining at home.	A
Design: Women with light UI	
In women with light incontinence, inserted, disposable pads designed for containment of urine are less likely to leak and are ranked higher by users than pads designed for containment of menstrual flow.	B
Design for moderate/heavy UI	
In men and women with moderate to heavy incontinence, no single body-worn absorbent product design (inserted pad, absorbent brief, or pull-up) performed significantly better than any other design.	A
Design: Women with moderate/heavy UI	
In women with moderate to heavy urinary incontinence, disposable pull-ups are preferred over disposable briefs.	A
Design: Men with UI	
Findings from a single multiple crossover trial of 68 men using up to 4 body-worn absorbent products for urinary incontinence (2 inserted pads with various designs, 1 device described as a dribble pouch, and 1 inserted pad with tight-fitted underwear) indicated that absorbance without leakage and comfort were the most important characteristics when ranking acceptability of these products. The dribble pouch had the lowest overall rating and the inserted pad with the greatest surface area (described as a leaf) had the highest.	B
Design: Men with moderate/heavy UI	
In men with moderate to heavy urinary incontinence, disposable briefs are preferred over pull-ups and other product categories for daytime and nighttime use.	A
Design and incontinence-associated dermatitis	
Findings from a multiple case series suggest that a body-worn absorbent brief with a *spiral fiber design* may reduce occurrences of incontinence-associated dermatitis.	C
Design: Light fecal incontinence (FI)	
An absorbent pad designed to place between the cheeks of the buttocks and over the anus reduces leakage of fecal matter onto perianal skin or underclothing, remains in place in a majority of users, and is preferred over an absorbent brief or products not designed for containment of FI.	B
Feminine hygiene pads are used by approximately one-third of community-dwelling adults with light FI in a single cross-sectional survey; more than half indicated that they are happy with this type of product.	B
Design and IAD in FI	
In critically ill, bedridden adults, a perianal pouch was more effective in reducing the incidence and severity of incontinence-associated dermatitis than were absorbent briefs.	B
Effects of using body-worn absorbent products	
Effect: IAD	
No differences were found when severity of incontinence-associated dermatitis in 4 body-worn absorbent products (2 types of disposable adult briefs, incontinence pads with snug-fitting mesh underclothing, pull-ups) was compared in a randomized multiple crossover exploratory trial of 78 skilled nursing facility residents.	B
Effect: Higher interface tissue pressures	
A single in vitro study using a 70-kg (154 lb) anthropomorphic dummy found that adding a body-worn absorbent pad inserted into tight-fitted underwear created significantly higher tissue interface pressures compared to those measured when the dummy was placed on the support surface naked. These differences were partially attributed to folds in the pad and smoothing the pad lowered tissue interface pressures. No differences were found when wet and dry pads were compared.	C
Effect: Altered voiding patterns and continence status	
Findings from 3 studies (1 prospective observational study and 2 prospective cohort studies) suggest that use of pads, especially in continent patients admitted to an acute care facility, alters voiding patterns and may prolong transient incontinence.	B

(*continues*)

TABLE 3.
Evidence-Based Statements (*Continued*)

Statement	Level of Evidence
Effect: Urinary tract infection	
A single comparison cohort study found that older adults residing in a nursing home who were incontinent and used body-worn absorbent products experienced significantly more urinary tract infections over a 12-mo period than did continent residents.	B
Dignity and quality of life (QOL)	
Evidence concerning effect of body-worn absorbent products on dignity and health-related QOL is mixed; 2 studies suggest that these outcomes are impaired when these products are used in acutely ill adults who are continent or incontinent on hospital admission or when used in community-dwelling adults with cognitive impairment; while a study of community-dwelling persons with incontinence not amenable to other interventions suggests that their use improves these outcomes.	B
QOL in Women	
In a qualitative study of women with light urinary incontinence, respondents indicated that poor pad performance, lack of discretion and complex regimens when changing pads created anxiety associated with their use.	C
QOL in men	
Ambulatory, community-dwelling men reported higher condition-specific health-related QOL (King's Health Questionnaire) in 1 randomized crossover trial comparing an external collecting device (sheathed/condom catheter) to absorbent pads (type of absorbent product not specified).	B
Wait time for pad change: Urine	
Hospitalized adults and direct care providers indicated significantly different acceptable wait times between pad soiling with urine and pad change in a cross-sectional study; nearly all patients indicated a 1-h maximum wait time while less than half of direct care providers indicated a maximum wait time of 1 h.	C
Wait time for pad change: Stool	
No significant differences occurred when hospitalized adults and direct care providers were asked to determine maximum acceptable wait time between pad soiling with fecal matter and pad change in a cross-sectional survey; nearly *all* indicated that wait times >15 min were unacceptable.	C

Abbreviations: IAD, incontinence-associated dermatitis; UI, urinary incontinence.

Pennsylvania, to generate and achieve consensus on best practices needed to construct a clinical algorithm for selection, use, and evaluation of body-worn absorbent products. Seventeen clinicians with expertise in this area of care were invited to participate based on their educational background, years of clinical experience, practice setting, and level of expertise (Table 4). The conference was facilitated by Laurie McNichol, a skilled moderator who has knowledge of this field and extensive expertise in the area of constructing and validating this type of algorithm. The 3-member task force and moderator McNichol generated draft statements for consideration by the panel. Each statement was read by the moderator and an initial vote was taken to determine level of agreement with the consensus. Votes were cast using an anonymous electronic system with a quota for approval of 80%. If an individual element did not reach an 80% quota after its introduction, up to 3 rounds of moderated discussion were held to see if the statement could be clarified or altered in a manner that enabled it to gain consensus. This process led to the generation of 42 consensus statements (Table 5).

DEFINITIONS DERIVED BY CONSENSUS

Assessment, product selection, and evaluation are based on multiple factors including volume and frequency of incontinence.[5] Multiple studies and both systematic reviews with meta-analysis identified 2 categories of urinary incontinence, light and moderate/heavy.[7,25-27] However, our search did not reveal standard definitions for these categories. In order to provide consistent criteria for this essential distinction, panel members research consensus on the following statements:

- *Light urinary incontinence varies widely based on volume, flow, and frequency. Body-worn absorptive products for light urinary incontinence are designed for leakage up to 100 mL.*
- *Moderate/heavy urinary incontinence varies widely based on volume, flow, and frequency. Absorptive products for moderate/heavy urinary incontinence are designed for leakage of more than 100 mL.*

Additional definitions to terms used in this article are summarized in the Glossary.

CONSENSUS STATEMENTS

Assessment

- *When assessing incontinent patients for selecting an absorbent product, consider the following factors:*
  - *Gender*
  - *Waist or hip circumference, if these cannot be measured, use body mass index as a reference*
  - *Mobility (ambulatory, assistance with transfers, bed bound)*
  - *Dexterity (ability to don and remove absorptive product independently)*
  - *Patient preference and acceptability and goals of care (consider cost and environmental impact)*
  - *Caregiver time, availability, and functional status*
  - *Cognition*
  - *Setting(s)*
- *Assess incontinence type (urinary, fecal, or dual incontinence) and severity.*

TABLE 4.
Consensus Task Force Members

Participant	Practice Setting/Affiliation
Mary Arnold Long, DNP, APRN, CRRN, CWOCN-AP, ACNS-BC	Acute Care/Roper Hospital, Charleston, South Carolina
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Mary R. Brennan, MBA, RN, CWON	Acute Care/North Shore University Hospital, Manhasset, New York
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Paula Erwin-Toth, MSN, CWOCN, FAAN	Private Consulting Practice, Deerfield, Ohio
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Marta Krissovich, ARNP, CWOCN-AP, CFCN	Private Consulting Practice, Port Townsend, Washington
Deborah Lekan, PhD, BSN, MSN	Faculty/UNC-Greensboro School of Nursing, Greensboro, North Carolina
Susan Logan, BSN, RN, ET, CWS, FACCWS	Home Care/Amedisys Home Health and Hospice Care, Roswell, Georgia
Katherine Moore, PhD	Faculty/University of Alberta, Edmonton, Canada
Denise Nix, MS, RN, CWOCN	Acute Care/Abbott Northwestern Hospital, Minneapolis, Minnesota
Joanne P. Robinson, PhD, RN, GCNS, FAAN	Faculty/Rutgers University, Camden, New Jersey
Donna Thompson, MSN, CRNP, FNP-BC, CCCN-AP	Long Term Care/Penn Medicine—Division of Urogynecology, Philadelphia, Pennsylvania

- *When assessing incontinent patients for selecting a body-worn absorbent product, consider timing of incontinence: day, night, or both.*
- *Consider multiple designs of body-worn absorbent products to manage incontinence in users depending up performance and personal preference.*

Panelists engaged in a robust discussion of variety of factors pertinent to assessment of persons with incontinence related to use of body-worn absorbent products. However, the final statement reflects those elements panelists found both necessary and essential for basic assessment of an individual considering use of an absorbent product. Panelists acknowledged that additional parameters may be included as part of the assessment in selected situations such as use of a bladder diary or weighted pad test to determine severity of incontinence, but these assessments were recognized as important for the evaluation of selected individuals in a specialty care or research setting rather than essential elements of basic assessment in a variety of care settings.

WOMEN WITH LIGHT DAYTIME URINARY INCONTINENCE

- *In women with light daytime urinary incontinence, disposable pads designed for urine are a first-line containment recommendation.*

While supporting evidence is limited, disposable absorbent pads were ranked highly in community-dwelling women with light urinary incontinence.[25,26] A variety of these products are commercially available and they are commonly used in facilities across the continuum of care and are widely used in community-dwelling women.

- *Based on patient preference and acceptability, disposable menstrual pads are an alternative in women with infrequent, light daytime urinary incontinence.*

Effective containment of urine and related odor, remaining in place, discreetness when worn under clothing, and wet comfort are the dominant factors influencing women's perceptions of the effectiveness of absorbent products. Women are familiar with the use of disposable menstrual pads, and evidence reveals that many prefer them for management of light urinary incontinence.[25] Discussion among panel members focused on the limited absorptive capacity of feminine hygiene pads (about 5-15 mL of fluid), but panelists also recognized existing evidence that some women prefer to change pads more frequently rather than use fewer absorptive pads specifically designed for containment of urinary incontinence. Panelists also observed that the lower costs and a wide availability of feminine hygiene pads may contribute to their attractiveness as an option for managing light urinary incontinence.

MEN WITH LIGHT DAYTIME URINARY INCONTINENCE

- *Disposable menstrual pads are not recommended for men with light daytime urinary incontinence.*

Disposable menstrual pads are sometimes used in the front of men's undergarments as a way to manage UI, and at least 1 cross-sectional survey found that men used these products for light fecal soiling.[34] However, panelists observed that these pads are not designed for the management of urinary or fecal incontinence in men, and sparse evidence suggests that they do not find their use especially effective.

TABLE 5.
Statements Reaching Consensus and Their Content Validity Index

Consensus Statement	CVI
Consider multiple designs of body-worn absorptive products to manage incontinence in users depending upon performance and personal preference.	1
When assessing incontinent patients for selecting an absorptive product, consider the following factors: Gender Waist or hip circumference, if these cannot be measured, use BMI as a reference Mobility (ambulatory, assistance with transfers, bed bound) Dexterity (ability to don and remove absorptive product independently) Patient preference and acceptability and goals of care (consider cost and environmental impact) Caregiver time, availability, and functional status Cognition Setting(s)	
Assess incontinence type (urinary, fecal, or dual incontinence) and severity.	1
Light urinary incontinence varies widely based on volume, flow, and frequency. Body-worn absorptive products for light urinary incontinence are designed for leakage up to 100 mL.	1
Moderate/heavy urinary incontinence varies widely based on volume, flow, and frequency. Absorptive products for moderate/heavy urinary incontinence are designed for leakage of >100 mL.	1
When assessing incontinent patients for selecting a body-worn absorptive product, consider timing of incontinence: day, night, or both.	1
When assessing incontinent patients for selecting body-worn absorptive products, consider perigenital skin status (intact, IAD, PI, friction injury, ITD, fungal, or other).	1
In women with light daytime urinary incontinence, disposable pads designed for urine are a first-line containment recommendation.	0.95
Based on patient preference and acceptability, disposable menstrual pads are an alternative for women with infrequent, light daytime urinary incontinence.	0.71
Disposable menstrual pads are not recommended for men with light daytime urinary incontinence.	0.95
In men with light daytime urinary incontinence, disposable pads (guards and shields) for urine are a first-line containment recommendation.	0.95
In men with light daytime urinary incontinence, consider contour, shape, and other design elements of pads (guards and shields) to maximize effectiveness and comfort.	1
Disposable absorptive products positioned over anus and between the buttocks are a first-line recommendation for women and men with light fecal incontinence or mucus incontinence.	0.91
If absorptive products used for light fecal incontinence become inadequate for containment or bothersome, consider use of absorptive brief or pull-up.	0.95
In men and women with light fecal incontinence or mucus incontinence, consider contour, shape, and other design elements to maximize effectiveness and comfort.	0.95
In ambulatory men and women with moderate/heavy daytime urinary, fecal, or dual incontinence, disposable pull-ups including super absorbent polymer technology are a first-line recommendation.	0.95
In ambulatory men with moderate/heavy daytime urinary, fecal, or dual incontinence, disposable absorptive briefs including super absorbent polymer technology are an alternative recommendation.	0.86
In ambulatory women with moderate/heavy daytime urinary incontinence, disposable shaped pads including super absorbent polymer technology worn with close-fitting underwear are an alternative first-line recommendation.	0.95
In nonambulatory men with moderate/heavy urinary incontinence, consider use of a disposable wrap to augment containment.	0.81
In men or women with moderate/heavy urinary incontinence, when briefs, pull-ups or underpads provide inadequate containment, consider addition of a booster product. Booster products should not be used for staff or caregiver convenience.	0.86
In nonambulatory women with moderate/heavy daytime urinary, fecal, or dual incontinence, disposable pull-ups or briefs including super absorbent polymer technology are recommended.	0.95
In nonambulatory toiletable women with moderate/heavy daytime urinary incontinence, disposable pull-ups including super absorbent polymer technology are a first-line recommendation.	0.91
In nonambulatory toiletable women with moderate/heavy daytime urinary, fecal, or dual incontinence, the use of disposable pad with close-fitting underwear is an acceptable cost-effective alternative.	0.91

(*continues*)

TABLE 5.
Statements Reaching Consensus and Their Content Validity Index (*Continued*)

Consensus Statement	CVI
In nonambulatory men with daytime urinary, fecal, or dual incontinence, disposable briefs including super absorbent polymer technology are a first-line recommendation.	0.91
In nonambulatory, toiletable men with moderate/heavy urinary incontinence, close-fitting underwear with integral pads or pull-ups are an alternative recommendation.	0.91
In ambulatory women with moderate/heavy nighttime urinary, fecal, or dual incontinence, the use of disposable pads including super absorbent polymer technology with close-fitting underwear is an acceptable alternative.	0.86
In nonambulatory women with moderate/heavy urinary, fecal, or dual incontinence, the use of disposable briefs including super absorbent polymer technology at night is a first-line recommendation.	0.95
In ambulatory and nonambulatory men with moderate/heavy urinary, fecal, or dual incontinence, the use of a nighttime disposable brief including super absorbent polymer technology is a first-line recommendation.	0.95
Reusable body-worn absorptive products may be considered as an alternative for community-dwelling men and women with urinary incontinence based on user and caregiver preference and specialty use (eg, swimming).	0.95
In nonambulatory, toiletable men with moderate/heavy urinary, fecal, or dual incontinence, disposable pull-ups are recommended as an alternative for daytime use.	0.95
Disposable or reusable diapers for infants are not recommended for incontinence containment for men with urinary, fecal, or dual incontinence.	0.95
Consider effective containment, comfort, cost, skin protection, and odor control when selecting pull-ups and briefs. When using a disposable brief, also consider tab seal/reseal properties. Design elements absorptive capacity, liquid acquisition rates, skin dryness, and rewet are standard measures for evaluating product performance in the laboratory. Additional research is needed to establish the relevance and clinical correlation of these parameters and other to clinical outcomes.	0.95
Consider fit, comfort, and skin barrier function when selecting body-worn absorptive products. Consider design elements including size (waist and hip circumference, surface area, and location of absorptive area), elastication (leg elastics and standing leg gathers), and maintenance of skin barrier properties (optimal pH, breathability or breathable side panels, pressure redistributing properties, and low-friction coefficients). Additional research is needed to establish the relevance and clinical correlation of these parameters and others to clinical outcomes.	0.95
Consider profile when worn beneath clothing, absence of rustling or other noise, odor control, and other design elements including aesthetic properties to optimize user dignity.	1
For users of body-worn absorptive products, application of corn starch or talc, and shaving, has not been found to reduce odor or optimize perigenital skin health.	0.95
Consider overall formulation and application (frequency and quantity) of leave on skin protectants and their potential ability to clog and reduce the absorptive capacity and other properties of body-worn containment products.	0.95
Change times of absorptive products should be patient centered (promote skin health, odor control, sleep, and elimination patterns and dignity) and should consider product properties. Change times should not be based on routine and caregiver convenience.	0.95
Absorptive products should be changed as soon as possible after a fecal incontinent episode to preserve skin health and promote odor control and dignity. Change times should not be based on routine and caregiver convenience.	1
To minimize sleep interruption in the user and to maximize containment in individuals with high-volume urine output, consider use of a booster pad as an adjunct to an absorptive brief or pull-up. Use of product should not be based on staff convenience.	0.95
The use of an unbreathable plastic outer layer or rubber pants to protect outer clothing or mattress is not recommended.	0.95
Individuals with incontinence and dementia should be considered for underwear-type products (underwear with pads, pants with an integral pouch, or disposable pull-ups) as a first-line recommendation to enhance the effectiveness of a toileting program, to normalize the toileting experience, to reduce agitation, and to promote safety.	0.95
The variety of body-worn absorbent products for morbidly obese individuals is limited. When selecting absorbent products for morbidly obese individuals, consider the emotional impact and skin barrier function (skin pH and microclimate, length of absorbent area from front to back, the ability to accommodate abdominal girth and leg size, and skin folds).	1

Abbreviations: BMI, body mass index; CVI, content validity index; IAD, incontinence-associated dermatitis; ITD, intertriginous dermatitis; PI, pressure injuries.

- *In men with light daytime urinary incontinence, disposable pads (guards and shields) for urine are a first-line containment recommendation.*
- *In men with light daytime urinary incontinence, consider contour, shape, and other design elements of pads (guards and shields) to maximize effectiveness and comfort.*

Findings from multiple studies indicate that no single product is best for all users.[5,7] Panelists noted that while these absorbent products are specifically designed for men, variability in their design is necessary given the variety of body contours of the various men seeking effective containment of light urinary incontinence, and no particular design can be identified as suitable for all men with light urinary incontinence.

AMBULATORY WOMEN AND MEN WITH LIGHT DAYTIME FECAL INCONTINENCE

- *Disposable absorbent products positioned over anus and between the buttocks are a first-line recommendation for women and men with light fecal incontinence or mucus incontinence.*
- *In men and women with light fecal incontinence or mucus incontinence, consider contour, shape, and other design elements to maximize effectiveness and comfort.*
- *If absorbent products used for light fecal incontinence become inadequate for containment or bothersome, consider use of absorbent brief or pull-up.*

Panelists readily agreed that research and evidence focusing on the use of absorbent products in persons with fecal incontinence are especially sparse. This paucity is reflected in the dearth of body-worn absorbent products specifically designed for fecal incontinence. Fortunately, a small number of products have been developed or adapted for placement over the anus that may provide effective containment of light leakage of fecal material or mucus from the anus.[42]

Nevertheless, panelists also recognized that individuals experiencing more frequent or severe fecal incontinence, such as that associated with high-volume diarrhea or involuntary defecation of formed stool, require a different type of absorbent product. While panelists engaged in a robust discussion of the need for further innovation in the design and manufacture of body-worn absorbent product for the management of fecal incontinence, they recognized the absorptive brief or pull-up as the most widely available and generally effective alternative for these individuals.

AMBULATORY ADULTS WITH MODERATE TO HEAVY DAYTIME URINARY, FECAL, OR DUAL INCONTINENCE

- *In ambulatory men and women with moderate/heavy daytime urinary, fecal, or dual incontinence, disposable pull-ups including superabsorbent polymer technology are a first-line recommendation.*

Mobility is a significant indicator when selecting absorbent body-worn products for men and women experiencing moderate/heavy dual urinary and fecal incontinence. Ambulatory adults who are mobile and able to transfer onto a toilet (toiletable) are likely to benefit from an absorbent product that can be removed and replaced in a manner similar to regular underclothing, and panelists recognize that pull-ups provide this design while briefs do not.

- *Consider effective containment, comfort, cost, skin protection, and odor control when selecting pull-ups and briefs. When using a disposable brief also consider tab seal/reseal properties.*
- *Consider fit, comfort, and skin barrier function when selecting body-worn absorptive products.*
- *Consider design elements including size (waist and hip circumference, surface area, and location of absorptive area), elastication (leg elastics and standing leg gathers), and maintenance of skin barrier properties (optimal pH, breathability or breathable side panels, pressure redistributing properties, and low friction coefficients).*

Design elements absorptive capacity, liquid acquisition rates, skin dryness, and rewet are standard measures for evaluating product performance in the laboratory, and performance attributes of effective containment of urine, stool and related odors, discreetness when worn under clothing, wet comfort, and skin dryness underneath an absorbent product have been identified as important performance parameters among users.[7,49] While additional research is needed to establish the relevance and clinical correlation of each of these parameters and how they are best measured in the laboratory and clinical settings, panelists concurred that attention to these design elements is a necessary component of assisting users and caregivers as they seek the best body-worn absorbent product or combination of products.

- *In ambulatory women with moderate/heavy daytime urinary incontinence, disposable-shaped pads including super absorbent polymer technology worn with close fitting underwear are an alternative first-line recommendation.*

Multiple panelists observed that women tend to prefer pads over alternative body-worn absorbent products. While many absorbent pads are designed for the management of light incontinence, other designs have higher absorptive capacities and, when combined with snug-fitting underclothing, can effectively contain larger volumes of urine while remaining discreetly in place.

- *In ambulatory men with moderate/heavy daytime urinary, fecal, or dual incontinence, disposable absorptive briefs including superabsorbent polymer technology are an alternative recommendation.*

Men with moderate/heavy urinary incontinence tend to leak at higher volumes than do women and they consider absorbance without leakage and comfort as the most important performance characteristics of a body-worn absorbent product.[7,27] Panelists observed that absorbent briefs provide these design features, and limited evidence suggests that men with moderate/heavy incontinence urinary incontinence prefer briefs to pull-ups or pads with snug-fitting underclothing.

AMBULATORY AND NONAMBULATORY PATIENTS WITH MODERATE TO HEAVY NIGHTTIME URINARY, FECAL, OR DUAL INCONTINENCE

- *In nonambulatory women with moderate/heavy urinary, fecal, or dual incontinence, the use of disposable briefs including superabsorbent polymer technology at night is a first-line recommendation.*

Panelists acknowledge that the term nonambulatory can be used to describe individuals who require assistance with movement or may be deemed bedridden. Several participants observed that disposable briefs are easier and safer to apply and remove by caregivers. Additional benefits discussed were the ability to contain moderate to heavy urinary fecal and dual incontinence and allow less frequent changes than other designs. Based on these considerations, the panel reached consensus that disposable absorbent briefs are a first-line recommendation.

- *In ambulatory women with moderate/heavy nighttime urinary, fecal, or dual incontinence, the use of disposable pads including superabsorbent polymer technology with close-fitting underwear is an acceptable alternative.*

Even when managing moderate/heavy urinary or fecal incontinence, evidence suggests that many ambulatory women prefer disposable pads, as long as they are able to provide effective and discrete containment of urine.[7,27] Panelists experienced in this area opined that the key to success for this use is the presence of the close-fitting underwear to ensure that they remain in place and ready to contain urinary leakage.

- *In ambulatory and nonambulatory men with moderate/heavy urinary, fecal, or dual incontinence, the use of a nighttime disposable brief including super absorbent polymer technology is a first-line recommendation.*

Panelists concurred that briefs are a first-line recommendation because of their high absorptive capacity and ability to rapidly absorb the higher-volume urinary incontinent episodes many men experience.

- *To minimize sleep interruption in the user and to maximize containment in individuals with high-volume urine output, consider the use of a booster pad as an adjunct to an absorptive brief or pull-up. Use of product should not be based on staff convenience.*

Many individuals with heavy/moderate UI are not amenable to be awakened during the night for a change of product, especially if fecal incontinence has not occurred. Panelists noted that a booster pad may effectively contain urine or stool and provide an opportunity for these individuals to experience fewer interruptions of sleep, resulting in multiple health benefits.

- *The use of an unbreathable plastic outer layer or rubber pants to protect outer clothing or mattress is not recommended.*

Panelists argued that use of plastic or rubber as an outer layer or barrier impairs the moisture barrier of the skin, resulting in increased cutaneous pH and a greater risk of developing IAD or other forms of moisture-associated skin damage.

NONAMBULATORY PATIENTS WITH MODERATE TO HEAVY DAYTIME URINARY, FECAL, OR DUAL INCONTINENCE

- *In nonambulatory women with moderate/heavy daytime urinary, fecal, or dual incontinence, disposable pull-ups or briefs including superabsorbent polymer technology are recommended.*

Evidence suggests that women with moderate/heavy urinary of fecal incontinence tend to prefer disposable pull-ups to briefs and other designs of body-worn absorbent products.[7,27]

- *In nonambulatory toiletable women with moderate/heavy daytime urinary incontinence, disposable pull-ups including super absorbent polymer technology are a first-line recommendation.*
- *In nonambulatory toiletable women with moderate/heavy daytime urinary, fecal, or dual incontinence, the use of disposable pad with close-fitting underwear is an acceptable cost-effective alternative.*

Panelists observed that disposable inserts or pull-ups are easier and quick to change than briefs in women who are able to stand, but they are paradoxically more difficult to apply and remove in women who are unable so stand. The ability of the patient to toilet is an important consideration when selecting a product for a woman who is nonambulatory but able to stand and pivot onto a toilet. Panelists opined that proper selection and use of body-worn absorbent products should consider this frequently encountered scenario.

- *In nonambulatory men with daytime urinary, fecal, or dual incontinence, disposable briefs including superabsorbent polymer technology are a first-line recommendation.*

As noted earlier, multiple panelists with expertise in the care of disabled or elderly adults noted that the disposable briefs provide a desirable suite of features for the nonambulatory man. In this case, they strongly recommended selecting a brief with a seal/reseal mechanism that provides not only containment but also safety for the patient and the caregiver.

- *In nonambulatory, toiletable men with moderate/heavy urinary incontinence, close-fitting underwear with integral pads or pull-ups is an alternative recommendation.*
- *In nonambulatory, toiletable men with moderate/heavy urinary, fecal, or dual incontinence, disposable pull-ups are recommended as an alternative for daytime use.*

Similar to the scenario described in nonambulatory women who can stand and pivot onto the toilet with assistance, panelists argued that these designs provide a desirable alternative that is easier to remove and replace than are absorbent briefs.

- *Disposable or reusable diapers for infants are not recommended for incontinence containment for men with urinary, fecal, or dual incontinence.*

Infant diapers are not designed for adult use. The products do not allow for securement in the waist or any undergarment, and the landing zone for best absorbency and the total capacity for absorbency are not designed for the anatomy and body habitus of adults.

CONTAINMENT AUGMENTATION

- *In nonambulatory men with moderate/heavy urinary incontinence, consider use of a disposable wrap to augment containment.*

Penile wraps are disposable absorbent products that encase the penis enabling more effective containment than absorbent pads or underpads. When used with a disposable pull-up or brief, this can extend life of the disposable pull-up or brief by allowing minimal interruption to change this penile wrap versus a complete change of the larger body-worn disposable.

- *In men or women with moderate/heavy urinary incontinence, when briefs, pull-ups, or underpads provide inadequate containment, consider addition of a booster product. Booster products should not be used for staff or caregiver convenience.*

Panelists opined that selective use of a booster pad may provide an opportunity for the patient to experience a longer interval of product use than when the booster pad is not used. As a result, they provide better containment for high-volume UI that may be used to decrease disruptions in sleep or preserve dignity during social activities.

PERIGENITAL SKIN CARE

- *When assessing incontinent patients for selecting body-worn absorptive products, consider perigenital skin status (intact, incontinence-associated dermatitis, pressure injuries, friction injury, intertriginous dermatitis, fungal, or other).*

Evolving evidence suggests that product design may influence the risk of skin damage associated with the use of body-worn absorbent products.[28,48] Panelists asserted that clinicians should maintain knowledge of this line of research and alter their recommendations for specific products should stronger evidence emerge favoring inclusion one or more design elements for the prevention of skin damage under body-worn absorbent products.

- *Consider overall formulation and application (frequency and quantity) of leave-on-skin protectants and their potential ability to clog and reduce the absorptive capacity and other properties of body-worn containment products.*

As noted earlier in this manuscript, evidence concerning the effects of leave-on-skin protectants is mixed. Evidence strongly suggests that selection and application of leave-on-skin protectants have the potential to impair fluid transfer. Panelist concurred that their effect on patients' skin health should be carefully monitored when these products are used together.

AESTHETICS, DIGNITY, AND WAIT TIMES

- *Change times of absorptive products should be patient centered (promote skin health, odor control, sleep and elimination patterns, and dignity) and should consider product properties. Change times should not be based on routine and caregiver convenience.*
- *Absorptive products should be changed as soon as possible after a fecal incontinent episode to preserve skin health and promote odor control and dignity. Change times should not be based on routine and caregiver convenience.*

These statements arose from robust discussion and agreement that wet and soiled absorbent products should be changed as soon as possible.

- *Consider profile when worn beneath clothing, absence of rustling or other noise, odor control, and other design elements including aesthetic properties to optimize user dignity.*

This statement arose from clinical experience and several studies that suggest that discreetness when worn under clothing is a significant consideration for persons selecting a body-worn absorbent product. In addition, other participants praised recent innovations in the aesthetic appearance of absorbent products and they expressed advocacy for the development of additional products that perform well while preserving pleasing aesthetic properties.

SPECIAL CONSIDERATIONS IN COMMUNITY-DWELLING, MORBIDLY OBESE, OR COGNITIVELY IMPAIRED INDIVIDUALS

- *Individuals with incontinence and dementia should be considered for an underwear-type products (underwear with pads, pants with an integral pouch, or disposable pull-ups) as a first-line recommendation to enhance the effectiveness of a toileting program, to normalize the toileting experience, to reduce agitation, and to promote safety.*

Normalization of the toileting experience is part of a therapeutic approach to patients with both dementia and incontinence. Though often overlooked, several panelists skillfully argued that selection of an absorbent product enables a more normal toileting experience. It may replace less acceptable toileting practices increasing both dignity and quality of life for these vulnerable individuals.

- *The variety of body-worn absorbent products for morbidly obese individuals is limited. When selecting absorbent products for morbidly obese individuals, consider the emotional impact and skin barrier function (skin pH and microclimate, length of absorbent area from front to back, the ability to accommodate abdominal girth and leg size, and skin folds).*

Panelists concurred that product design elements must be selected that optimally accommodate the special needs of this population. Less than good fit or using products not designed for this population can lead to emotional distress and a loss of personal dignity. Several panelists also argued for a call to

manufacturers to develop and market designs better suited to this increasingly prevalent condition.

- *Reusable body-worn absorptive products may be considered as an alternative for community-dwelling men and women with urinary incontinence based on user and caregiver preference and specialty use (eg, swimming).*

Evidence clearly indicates that no one product meets every need, and users of absorbent products seek out a combination of products when engaging in a variety of activities. While disposable products are frequently preferred over washable ones, panelists noted that some users prefer reusable products based on the underlying activity or cost concerns.

CONTENT VALIDATION

Given the paucity of evidence in this area of care and the need for extensive reliance on consensus-based statements, content validation was completed to strengthen the validity of best practice recommendations generated by the consensus panel. The methods used for content validation were described by Grant and Davis.[50] An independent and interdisciplinary panel of 21 clinicians with expertise in the field of continence care and use of absorbent products was empaneled (Table 6). Panel members were asked to rank their level of agreement on a scale of relevance ranging from 1 to 4 where 1 indicates that the statement is not relevant/appropriate, 2 indicates that the individual is unable to assess relevance without revision, 3 indicates that the statement is relevant but needs minor alteration, and 4 indicates that the statement is very relevant and appropriate.

Data analysis was conducted utilizing SAS/STAT software, version 9.4 of the SAS System (2012 SAS Institute, Cary, North Carolina). Data were coded and entered by a data coordinator, analyzed by the biostatistician, and reviewed by the authors. The content validity index was calculated for each consensus statement.

Table 5 summarizes the quantitative analysis on interrater agreement and lists the content validity index for each individual consensus statement. Polit and colleagues[51] suggest a cutoff for agreement of 0.78 for 3 or more reviewers. The quantitative analysis revealed that the majority of the expert panel felt that the consensus statements were ranked as "very relevant and appropriate" or "relevant and needed only minor alteration."

DISCUSSION

The results of this scoping literature review and subsequent Consensus Conference highlighted the paucity of evidence and clinical resources driving the selection, use, and evaluation of body-worn absorbent products for the management of fecal incontinence. While the Task Force, Consensus Conference participants and Content Validity experts agree that

TABLE 6.
Content Validity Panel Members

Participant	Practice Setting/Affiliation
Carolyn Crumley, DNP, RN, ACNS-BC, CWOCN	Saint Luke's East Hospital and University of Missouri Sinclair School of Nursing, Lee's Summit, Missouri, and Columbia, Missouri
Carole Bauer, MSN, RN, ANP-BC, OCN, CWOCN	Beaumont Health System, Troy, Michigan
Catherine T. Milne, APRN, MSN, ANP/ACNS-BC, CWOCN-AP	Connecticut Clinical Nursing Associates, Bristol, Connecticut
Lindsay McCrea, PhD, RN, FNP-BC, CWOCN	Cal State East Bay, Hayward, California
Adrian Wagg, MB, BS, FRCP, FRCP(E), FHEA (MD)	Professor, Department of Medicine, University of Alberta, Edmonton, Alberta, Canada
Lynette Franklin, MSN, ACNS-BC, CWOCN-AP	Emory University, Atlanta, Georgia
Tara Beuscher, DNP, RN-BC, GCNS-BC, ANP-BC, CWOCN, CFCN, NEA-BC	UVA Transitional Care Hospital, Charlottesville, Virginia
Mary H. Palmer, PhD, RNC, FAAN, AGSF	University of North Carolina at Chapel Hill, Chapel Hill, North Carolina
Mary F. Mahoney, MSN, RN, CWON, CFCN	UnityPoint Health, Des Moines, Iowa
Barbara A. Dale, BSN, RN, CWOCN, CHHN, COS-C	Quality Home Health, Livingston, Tennessee
Angela S. Richardson, BSN, RN, CWOCN	Duke University Health System, Durham, North Carolina
Kevin R. Emmons, DrNP, APN, AGPCNP-BC, CWCN, DAPWCA	Rutgers, School of Nursing-Camden, Camden, New Jersey
Phillip J. Botham, MSN, RN, CWON	BCS, LLC, Charleston, South Carolina
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Dianne Mackey, MSN, RN, CWOCN	Kaiser Permanente, San Diego, California
Karen Zulkowski, DNS, RN, CWS	WCET, Captain Hook, Hawaii
Christine Berke, MSN, RN, APRN-NP, CWOCN-AP, AGPCNP-BC	Nebraska Medicine, Omaha, Nebraska
Janet Ramundo, MSN, RN, CWOCN	Houston Methodist Hospital, Houston, Texas
Sheila Howes-Trammel, MSN, APRN, FNP-BC, CWCN, CCCN, CFCN, CLNC	Hennepin County Medical Center, Minneapolis, Minnesota
Sandra Rohr, MSN, RN, ARNP, FNP-BC, CWOCN	Mercy North Iowa, Mason City, Iowa
Jody Scardillo, DNP, RN, ANP-BC, CWOCN	Albany Medical Center, Albany, New York

GLOSSARY

Absorptive capacity	The maximum capacity of fluid an absorbent product can hold; this value is determined in the laboratory using a standardized technique (MA009-1).
Breathability	Airflow within an absorbent product that allows release of heat, perspiration, and gas in the pelvic girdle region.
Brief	A body-worn absorbent garment that is shaped similar to a diaper and has tabs that seal and reseal with adhesive, Velcro or hooks.
Elastication	The ability of elastics that are woven together to maintain fit snugly around the waist or thigh despite repeated movement.
Insert	An absorbent product, often shaped and contoured to fit into underwear in the crotch panel, to absorb urine. Often referred to as a liner, guard, or shield.
Leaf	See shield.
Liners	An absorbent pad with an adhesive strip that will allow it to be placed in regular underwear.
Liquid acquisition rate	The speed at which urine is wicked away from the skin by an absorbent material.
Nonambulatory	The inability to move independently from bed or chair or be able to transfer or reposition without maximum assistance of another.
Pad	An absorbent, often shaped and contoured to fit into the crotch panel of underwear to absorb urine. Often referred to as a liner, guard, or shield.
Pouch	An absorbent pocket that fits over the penis and often can hold 1-2 oz of urine. It can be used with other products.
Pull-up	A body-worn absorbent garment that generally has an elasticated waist and hip area, or that has an elastic strap for security, designed to be similarly applied and removed similar to underwear.
Retention capacity	The maximum volume of fluid an absorbent product can hold without leaking.
Rewet	A measure of an absorbent material's ability with multiple incontinent episodes.
Shield	An inserted absorbent product that covers the penis and scrotum that can be used with close-fitting underwear to absorb urine in the front of the garment. Sometimes referred to as a leaf.
Toiletable	The ability of an individual to transfer to a toilet or commode with or without assistance for voiding or defecation purposes.
Wrap	An absorbent, layered pad that fits around the penis and wicks away urine. It is similar to a pouch and can be used in conjunction with other products.

an interdisciplinary approach with multiple interventions is essential for the management of fecal and urinary incontinence, we also recognize the prevalence of use of body-worn absorbent products and the importance of their use for many incontinent individuals.

The scoping literature review identified several gaps in research that should be addressed without delay. The first is the gap between laboratory-based tests used to determine performance of absorbent products and clinically relevant outcomes that drive users, caregivers, and clinicians to select and use a particular product. Several groups have addressed this issue in detail[49,52,53] and we strongly encourage others to build on their work and continue to seek methods that more closely link testing in the laboratory or in healthy human volunteers with outcomes measured during clinical trials.

A second major gap is the lack of research and product development for individuals with fecal incontinence. Even given the overall paucity of evidence in this area, we were concerned to find that the vast majority of studies and commercially available products are primarily designed for the absorption of fluid rather than the containment of stool, and solid stool in particular. We applaud the exploratory studies that have identified some of the key issues surrounding the development and refinement of body-worn absorbent products designed for persons with fecal or mixed fecal and urinary incontinence[34,42] and strongly advocate for additional research and product development for these underserved patients.

CONCLUSIONS

Findings from a scoping review identified limited evidence and multiple gaps in research related to body-worn absorbent products. In order to address these gaps, the WOCN Society has committed itself to develop an evidence- and consensus-based algorithm for selection, use, and evaluation of body-worn absorbent products for the management of individuals with urinary and/or fecal incontinence. This algorithm will help to fill the gap in resources available to first-line and WOC specialty practice nurses guiding optimal use of these products.

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