

# Commodity analysis of medical products used in adult incontinence

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## Abstract

There are problems people don't want to talk about, and one of them is incontinence in adults. This is a fairly common and delicate problem. It negatively affects human life. This most often applies to people with disabilities and bedridden patients. People have to change their usual way of life, give up their favorite activities, there is a constant need to stay at home. Walking, attending events are difficult. All this has a corresponding effect on the psychological health of a person. In such a situation, it is advisable to use diapers for adults. This is a modern hygienic product that is intended to make life easier for people suffering from various forms of incontinence. Diapers are similar in shape to baby diapers, but they are adapted to the size of an adult. This is a great option for the care of patients who are bedfast or in a wheelchair.

## Keywords

medical devices, diapers for adults, classification, personal hygiene products, bedsores, care of bedridden patients

## Introduction

Worldwide more than 200 million persons suffer from severe forms of urinary and/or fecal incontinence and a significant number ranging from 22% to 26% report mild urinary incontinence problems (Lewicky-Gaupp et al. 2009). Population-based studies reported a prevalence of moderate to severe urinary incontinence of more than 42% in over 60-year-old women (Melville et al. 2005). While the true prevalence is unknown, some epidemiological studies suggest a frequency of fecal incontinence of 2.7% (daily) 4.5% (weekly), and 7.1% (once per month or less) in individuals 18 yr or older in the outpatient setting (Johanson and Lafferty 1996). The symptoms of incontinence can be treated with a wide range of conservative

therapies, surgery and drugs (reviewed by Madoff et al. 2004 and Norton and Brubaker 2006). However, in many patients these therapies fail to some extent and incontinence impairs the quality of life and is extremely embarrassing for the affected patients.

Therefore, this study aimed to carry out commodity analysis of personal hygiene medical products for incontinence in adults.

Absorbent incontinence products are the mainstay if all other therapies have failed. Their basic technology is derived from baby diapers (Campbell 1987; Berg et al. 1994) while design and additional features are specifically adapted to adults. For example fluid absorption capacity reflects the larger urinary volumes in adults, the outer cover materials are selected to avoid rustling noises and

the anatomical shapes are designed for maximal fit and wearing comfort (Fader et al. 2008a, 2008b). While technological development continuously improves the performance (Brazzel et al. 2002; Beguin et al. 2010)

Medical devices are any instruments, apparatus, devices, tools, equipment, implants, materials or other products, including invasive and those that are not intended to achieve the main therapeutic goal in the human body, but to directly promote the functions of pharmacological, immunobiological or metabolic agents to achieve this goal, as well as products used both individually and in combination with each other, including software necessary for their proper use, provided by the manufacturer, for the purpose of: prevention, diagnosis, treatment, monitoring or relief of the patient's condition in case of illness, injury, mutilation or as compensation for organ deficiency or physical defect; research, replacement or modification of the structure (anatomy) of organs, tissues or physiological processes; control over the fertilization process (DSTU 4388: 2005). Standardization of medical devices is currently carried out in accordance with technical regulations.

Technical regulations for medical devices were first adopted in 2008, but their mandatory application has been constantly postponed. Subsequently, they were revised; the latest versions of technical regulations were approved by resolutions No. 753, 754 and 755 of the Cabinet of Ministers of Ukraine dated 02.10.2013. From July 1, 2015, Technical Regulations became mandatory for all medical devices, except those registered in accordance with the legislation in force before 01.07.2015 and are allowed to be marketed and used for their intended purpose without taking into account the new requirements.

Disposable diapers are absorbent hygiene products used by people with reduced mobility. In the case when the patient is bedridden, sooner or later bedsores and bumps appear, if special care is not provided. Adult diapers should be used to prevent undesirable consequences and reduce discomfort. These products are actively used in medical institutions, as well as in the process of home care.

In addition to bedridden patients, diapers will also be in need for the elderly, who find it difficult to control the process of urination; patients in the postoperative period, who are forbidden to get out of bed for some time; representatives of certain professions, the activities of which require a long stay in the workplace; pregnant women suffering from a similar problem.

History of creation. The first to think about creating diapers was the American inventor Marion Donovan. In 1946, using waterproof bathroom curtains, she sewed a diaper cover that protects the sheets in the crib from getting wet. The final version was made of parachute nylon and had plastic buttons as fasteners. In 1951, Marion received a patent for her invention, which became popular. But attempts to create disposable absorbent diapers on a paper basis failed: the paper companies to which Marion turned, just exposed her to ridicule, saying that "it's impractical and no one needs it."

Victor Mills, an engineer at Procter & Gamble, a manufacturer of the Pampers diaper brand, suggested using the superabsorbent as an absorbent material. The first disposable diaper appeared in 1956 and was made on the basis of sawdust. Massively disposable diapers began to be introduced around 1961 and were called "Pampers" from the English verb "to pamper". By the end of the 60's, "Pampers" became a global brand. Initially, they produced diapers with Velcro fasteners and buttons, but since the 1980s, Velcro has become the predominant form of fasteners. (Krafchik 2016).

Since 1974, the problem of incontinence in adults has been studied at the European company Hartmann. Loose cellulose diaper *molinea plus* became the basis for the production of underwear for incontinence. The first brand of adult diapers in the United States – Depend – appeared in 1984 at Kimberly Clark, a manufacturer of Huggies baby diapers. (<https://www.miloserdie.ru/article/podgu-znik-iz-shkur-iz-opilok-iz-plastika-uvlekatelnaya-istoriya-pampersa-2/>)

## Objectives of the study

Conducting frequency and descriptive analysis of personal hygiene products – diapers for adults and research of their product range.

## Research methods

Frequency and descriptive analysis, use of product range from online trading platforms: pharmacy 911 – <https://apteka911.ua/> and <https://med-magazin.ua/>.

The study design is based on "consumer stairs" that represent a consumer's steps in making a decision to buy a product. The "stairs" are as follows:

1. Identifying the need. The consumer is aware of the need to buy a product.
2. A person needs to analyze some characteristics: manufacturer; price; feedback from other consumers.
3. Comparison of goods. After making an analysis, the consumer weighs the pros and cons and selects the best candidates.
4. The final decision – the purchase of goods. The final assessment of all previous indicators allows making a purchase.

## Results and discussion

More than 60 years have passed since the creation of the first advanced diaper. This invention has greatly facilitated the lives of many generations of parents. Adult diapers are a relatively new discovery that has been in use for about 30 years, but since their emergence, this medical device has been appreciated by many bedridden patients.

Due to the use of high-quality raw materials, the probability of fluid leakage, as well as the risk of bumps are minimized. To make diapers work to fulfill their main purpose, namely, maximum fluid absorption, it is important to choose the right characteristics of the diaper. Today, the classification of diapers is as shown in Figure 1.

Absorption can be medium, high or maximum. Diapers of the latter group absorb approximately 2900 mL of liquid, so they are suitable for severe urinary incontinence and for use at night.

Size also plays an important role. It must exactly match the anatomical features of the patient. Products that are too large should not be chosen, otherwise they will slip and leak.

In carrying out the frequency and descriptive analysis, we have decided to use three main criteria on which consumers rely, when choosing a product of a particular manufacturer, namely – the manufacturer, price, and consumer feedback.

Since diapers are products that are designed for hygiene, the requirements for their quality are very high. Every manufacturer is obliged to follow the declared quality standards in the most careful way. Modern diapers consist mainly of natural materials, the absorbent layer of which is a mixture of cellulose and gelling agent. The inner lining of the diaper, through which the liquid passes, is made of non-woven fabric based on heat-bonded polypropylene. The outer side is made of fabric-like polyethylene film, elastic elements (leg cuffs, belt, and fasteners) are made of natural rubber and polyurethane. The surface of the film adjacent to the body is perforated, so, passing the liquid through to the layer of viscose, it remains dry. Due to this, an air layer is formed between the body and the film, which does not prevent the skin from breathing. The efficiency of use is one of the main criteria for assessing the consumer properties of the product. The main criterion

for the effectiveness of diapers is the ability to absorb and retain moisture (Diadiun 2015).

The Ukrainian market has more than 25 manufacturers. The most popular companies are: AFA, Abena, Dailee, Depend, Dr. Skipp, Evona, Joly, Seni, Senso Med, Tena, Snow White, iD.

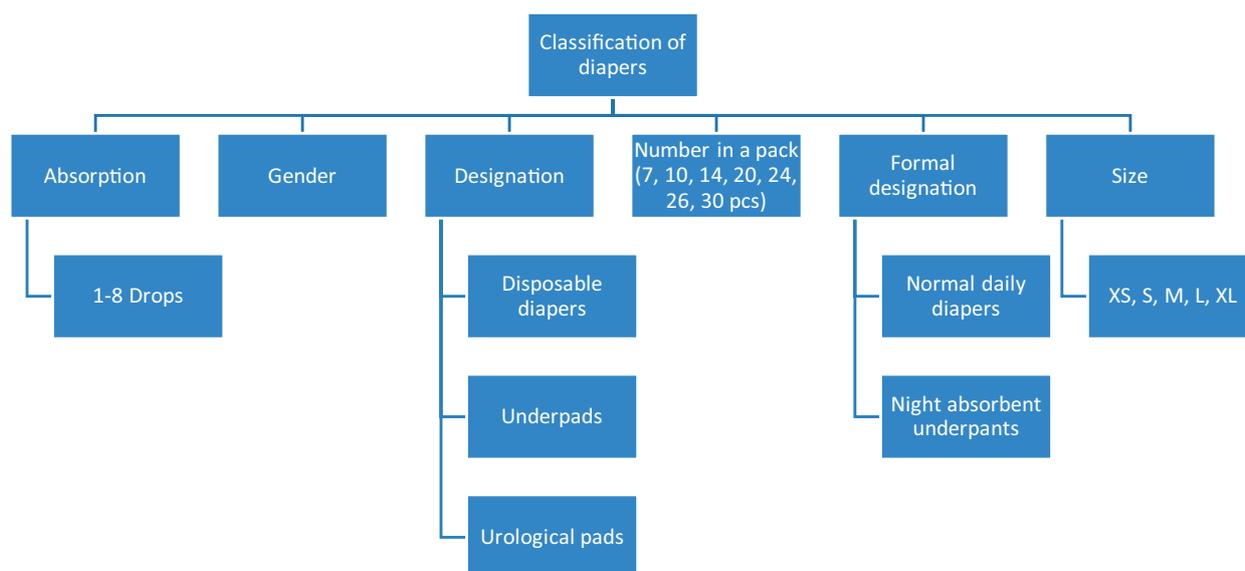
Choice of a particular product might be difficult for a customer. Usually people follow the below steps when making a decision to buy a product.

1. Identifying the need. The consumer is aware of the need to buy a product.
2. The person needs to analyze some characteristics: manufacturer; price; feedback from other consumers.
3. Comparison of goods. After making an analysis, the consumer weighs the pros and cons and selects the best candidates.
4. The final decision is to purchase the goods. The final assessment of all previous indicators allows you to make a purchase.

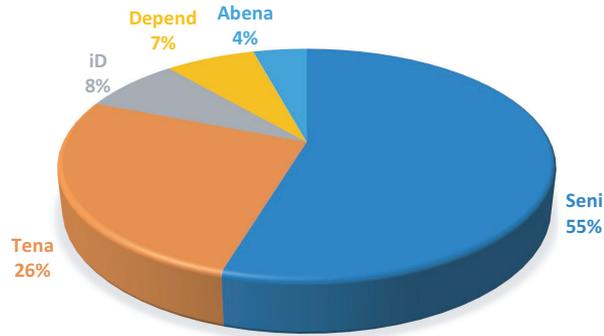
In our work we have attempted to use this approach to carry out commodity analysis of adult diapers.

We have decided to select for analysis 5 manufacturers whose products are the most common – Seni, Tena, iD, Depend, Abena (Fig. 2).

Let's take a closer look at Seni's products. These breathable products are of several types: Seni Super – ordinary, Seni Super PLUS – high absorbency, Seni Super TRIO – high, and Seni Super Quatro – very high absorbency. Diapers with normal and high absorbency are suitable for those who are able to move independently and change underwear often enough. For bedfast patients and in cases where diapers have to be changed only twice a day, it is better to use models with high and very high



**Figure 1.** Classification of diapers for adults according to <https://med-magazin.ua/>.



**Figure 2.** Segment analysis of manufacturers of adult diapers, the number of which is presented according to the medical equipment store.

absorbency. It is also possible to use the mobile application SeniControl, which allows keeping an electronic diary of urination, determine the degree of incontinence and choose an absorbent product for oneself or loved ones.

Tena diapers are used for moderate to severe incontinence. Tena Slip Super – “night” diapers-briefs for adults, in severe incontinence and day diapers TENA Slip Plus – comfortable and reliable to use, both for mobile people and for bedridden patients. Features: double absorbing layer with superabsorbent, elastic belt, breathable surface, comfortable fasteners, filling indicator, high degree of absorption.

Absorbent underwear for women Depend is created taking into account anatomic features of a body. They have gender differences. Women’s diapers are flat, while men’s have a pocket-shaped insert. Features: soft, convenient, quickly absorbing channels, the special filters eliminating a smell. Diapers for adults iD Slip plus Consumer are intended for use at a moderate and severe degree of incontinence at adults, with the size of a waist from 115 to 155 cm. Due to the high absorbency, diapers guarantee the user a sense of protection against leaks and optimal comfort. The soft outer surface provides maximum comfort when using, and the side panels of moisture-proof material prevent leakage from the sides, providing a feeling of security and confidence. Tests have shown that this product does not cause skin irritation.

Abena (Abri-Form Premium) is a complete line of premium diapers for adults with moderate and severe incontinence. Differences of Abri-Form Premium from other diapers: 3 degrees of protection against leaks (unique absorbent channels, 6 layers, high sides directed inside the diaper), has additional protection against leaks from the back (the first in Ukraine diapers with a pocket that retains liquid), soft sidewalls, unlike ordinary rubber, do not leave marks on the thighs, the liquid turns into a gel and can not leak (<https://med-magazin.ua/>, <https://apteka911.ua/shop/podguzniki-dlya-vzroslyih>).

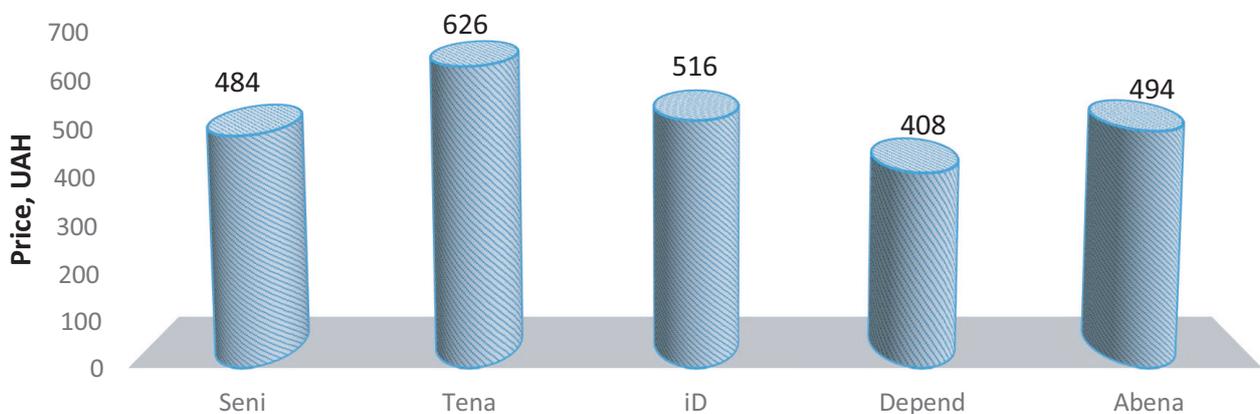
Using the information about the products of the selected range, which we took from <https://med-magazin.ua/>, we have obtained the following data: in the Ukrainian market Seni contains 248 products for various purposes, Tena – 120, iD – 35, Depend – 32, Abena – 19. Seni (Poland) has the largest number of goods – 248 units. The second place is occupied by the company Tena (Slovakia) – 120 units. (<https://med-magazin.ua/>)

When analyzing the pricing policy (Fig. 3), we took into account products that contain the same number of diapers in the package and the same absorbency.

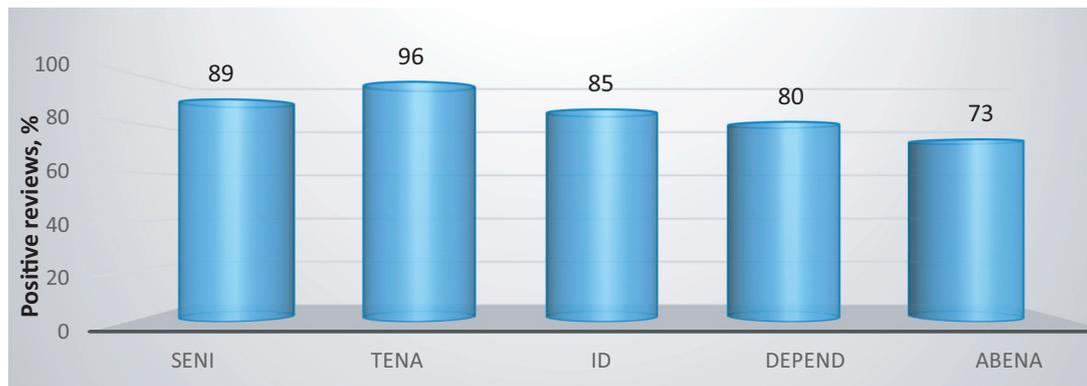
The cheapest product is Depend (Czech Republic) – UAH 408. Second place takes Sena (Poland) – 484 UAH. The most expensive product was a product by Tena – 626 UAH. (<https://apteka911.ua/shop/podguzniki-dlya-vzroslyih>)

A consumer survey was conducted. According to the analysis of consumer feedback (Fig. 4), the first place is occupied by Tena – 96%, then Seni – 89%, iD – 85%, Depend – 80%, Abena – 73%. Therefore, we can conclude that consumers are more satisfied with Tena and Seni products (<https://med-magazin.ua/>).

It should be noted that in the choice of adult diapers off-line customers can be guided not only by other people’s opinion, but also recommendations of a pharmacist. It is his responsibility to provide most complete information on any group of the pharmacy assortment including adult diapers. In online stores this function might be, to some extent replaced by available filters and/or live text chat with competent operator.



**Figure 3.** Frequency analysis of the price category of diapers for adults according to the medical equipment store.



**Figure 4.** Frequency analysis by the number of positive reviews.

## Conclusion

The use of adult diapers is necessary for patients in the postoperative period, who have moderate or severe urinary incontinence, with enuresis, in rehabilitation, after heart attacks, strokes, complex fractures and injuries, mental and neurological diseases, for the care of bedrid-

den patients (with limited opportunities and the elderly). Thus, diapers are an exceptional and necessary means of hygiene, endowed with a large number of characteristics that ensure the consumer qualities of this group of goods.

These consumer characteristics, in combination, become the determining criteria for the competitiveness of this category of goods.

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