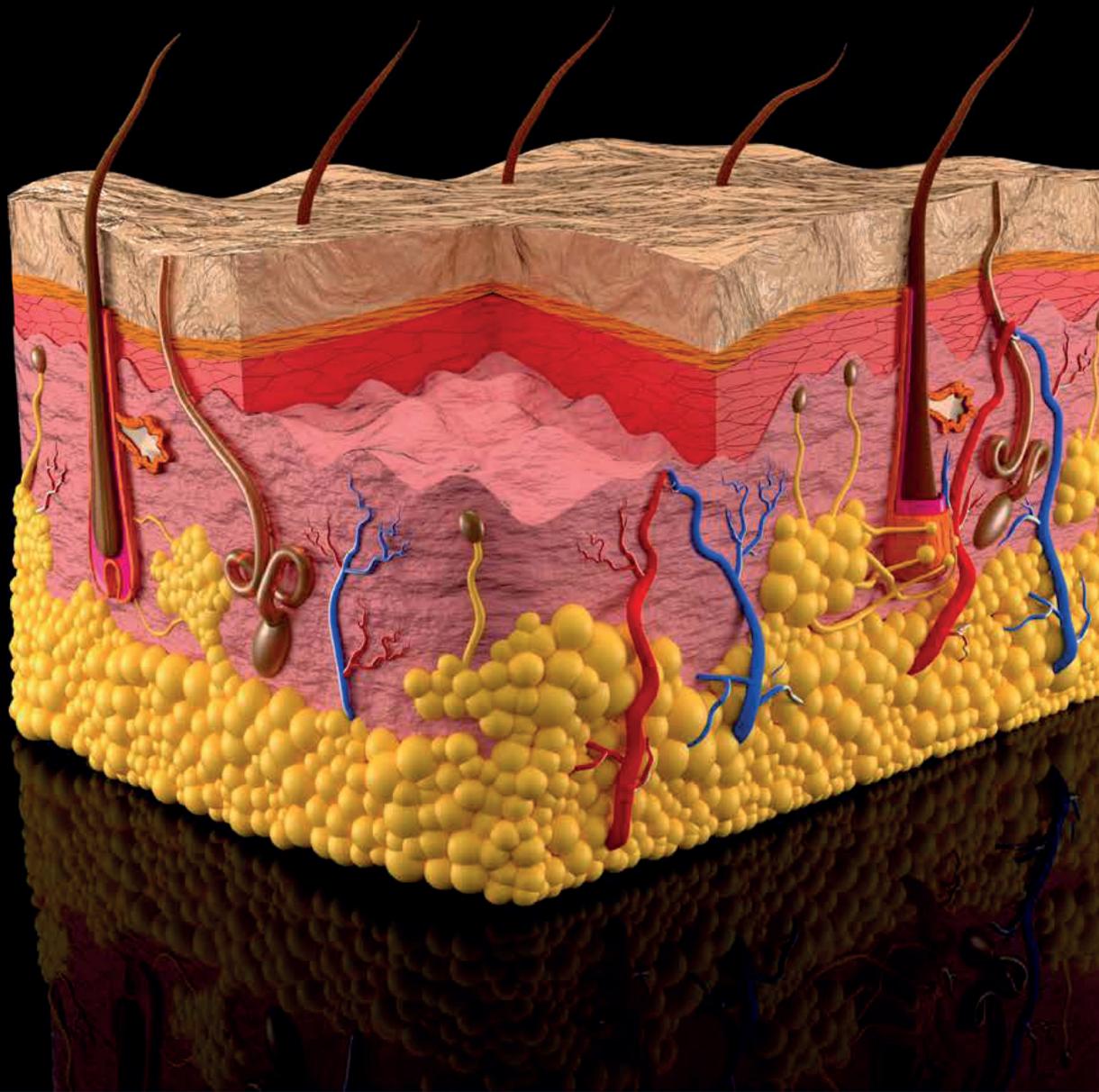


Plus-Size: Pressure care and skin integrity

The skin is the body's largest organ and is made up of three layers within which millions of cells work together to maintain the skin's integrity (i.e. keep the skin healthy and intact).



Knowledge bank

1. The epidermis

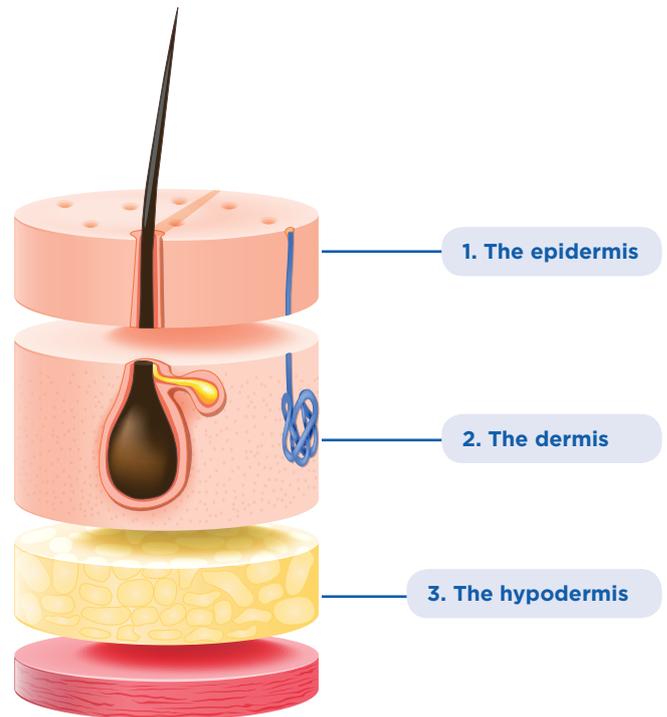
- The top or outermost layer of skin
- Provides a waterproof barrier and creates our skin tone

2. The dermis

- Located beneath the epidermis
- Contains tough connective tissue, hair follicles and sweat glands

3. The hypodermis

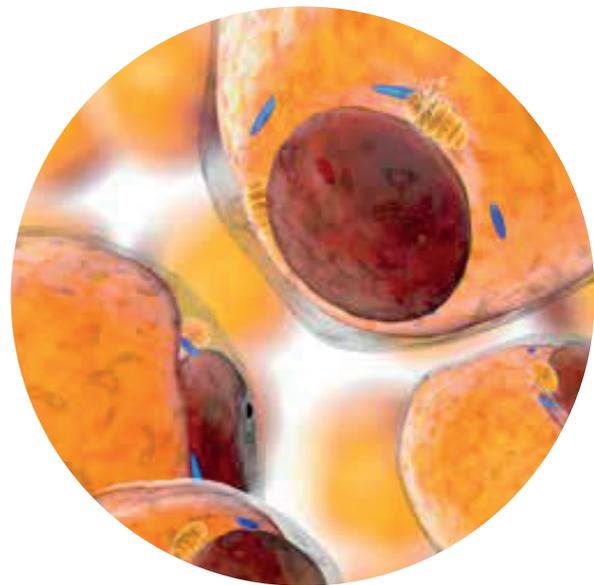
- Located deep beneath the other layers of skin
- Made of adipose (fat) tissue and connective tissue



Adipose tissue explained

The main role of the adipose (fat) tissue is to store energy in the form of fat and act as a nutrient reserve, as well as providing cushioning and insulation (warmth). Obesity is not dependent on the amount of body weight, but on the amount of body fat (adipose tissue) that is present. Although primarily located beneath the skin, the adipose tissue can also be found around internal organs.

Although commonly described as avascular (having a lack of blood vessels) a study by Markman and colleagues took a closer look at the anatomy and physiology of adipose tissue and found it is separated into lobules. Each lobule is made up of thousands of fat cells carrying large vessels and neurons. Plus-size people have a greater number of large vessels, which results in a reduced capillary density. This is due to the newly created fibrotic and rigid environment within the adipose tissue, restricting capillary proliferation. It is then down to the large vessels to deliver oxygen, which are not as efficient as the capillaries, leading to vascular insufficiencies.



Adipose Tissue

Plus-size skin challenges

1

Difficulties reaching certain areas of the body:

- An example of this is excess skin around the abdomen, known as the pannus, or being able to clean oneself properly after toileting. Each can result in poor personal hygiene. Urine or faeces may be left on the skin and even if it's for a relatively short period of time, it can contribute to skin breakdown.

2

Circulation:

- This can be an issue for those who are plus-size as blood doesn't travel well through adipose tissue. In addition, these individuals are more at risk of diabetes, which is also known to cause poor circulation. Compromised circulation impairs the skin's ability to heal itself as oxygen, nutrients and minerals are not able reach the cells and tissue. These are essential for healing.

3

Friction (skin rubbing together):

- Friction between the thighs is extremely common. Friction can lead to skin breakdown and infection.

4

Skin folds:

- Large, deep skin folds make it more difficult for plus-size individuals and their caregivers to assess and monitor changes in the skin.

5

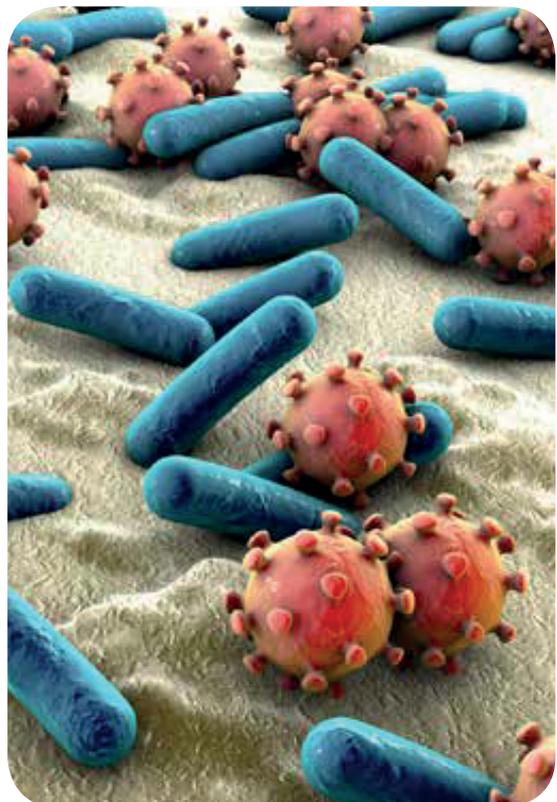
Physical immobility:

- This is the main cause of skin injury as it can often lead to pressure ulcer formation. This is usually because of the inability to adequately turn or reposition the plus-size individual when lying down.

Skin infections

Skin infections in plus-size people can range on a spectrum from simple benign conditions to life threatening necrotising infections. Obesity increases the risk for skin infections due to:

- Excessive skin folds that trap humidity and moisture, inducing maceration and related microbial overgrowth
- Lymphatic flow is hindered, decreasing oxygenation of surrounding tissues
- Increased tension on wound edges may predispose to poor wound healing or actual dehiscence of a closed wound
- Skin pH tends to be higher, increasing risks for candida which thrive in alkaline environments



Common skin related problems

The following explains some of the skin related problems plus-size people may experience. Please note, this list is by no means exhaustive and further reading is recommended.

Pressure ulcers

According to the National Pressure Ulcer Advisory Panel (NPUAP), a pressure ulcer is defined as a localised injury to the skin and/or underlying tissue usually over a bony prominence, because of pressure, or pressure in combination with shear.

As well as developing in more common areas such as the buttocks, sacrum and heels, pressure ulcers in plus-size individuals also occur in uncommon areas and are referred to as atypical pressure ulcers. They are commonly found below a large pannus, but can occur anywhere on the body, including the neck, upper back, upper medial thigh, flanks and posterior legs/ankles. What may not be so evident is the development of an atypical pressure ulcer which is located deep within skin folds, which create pressure on each other. Thorough daily skin inspection is therefore critical.

Poor nutrition

Poor nutrition is another risk factor for skin breakdown and pressure ulcer development.

Plus-size individuals are frequently malnourished as their weight may be due to increased ingestion of high-density energy foods that are high in fat and sugars, and low in vitamins, minerals and other micronutrients.

Lack of repositioning

Tissue perfusion i.e. the ability of substances to move in/out of tissue is decreased for longer periods of time in those who are plus-size, as skin and tissue becomes subject to the pressure and weight of other tissue on it. This means that oxygen, nutrients and essential minerals are prevented from passing within the cells which can lead to eventual cell death.

An effective individual repositioning schedule should be undertaken to relieve pressure from vulnerable areas. It is also important that the position/location of intravenous lines, catheters and tubes are checked on a regular basis to prevent rubbing or pressure build up on the skin. Poorly sized beds and equipment can also cause skin integrity issues, therefore, it's essential that equipment meets the individual's weight and body shape requirement.

Venous insufficiency

Venous insufficiency is a problem with the blood flow from the veins in the legs, back to the heart.

Venous insufficiency can cause chronic wounds on the legs and can severely delay wound healing, increasing the risk for infection. Once venous function in the lower extremity is disrupted, fibrosis and clots occur in the capillaries, which subsequently decreases the diffusion of oxygen and nutrients needed to supply tissue and support wound healing. The 'gold standard' for treatment of lower limb venous insufficiency is compression via either garments or dressings. Elevation of the lower extremities also aids venous return.



Skin problems (continued)

Diabetic foot ulcers

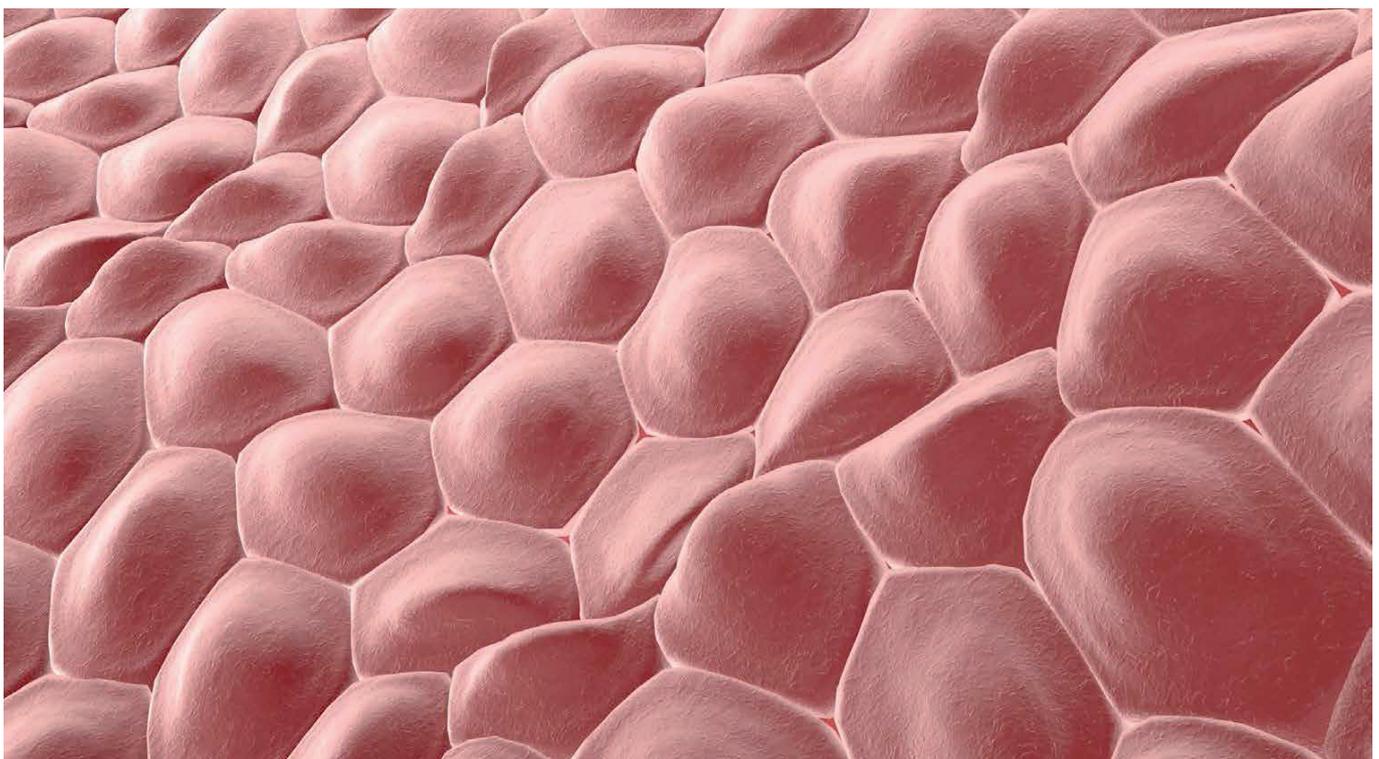
- **It is estimated that diabetic foot ulcers occur in about 15% of people with diabetes. Foot ulcers and infections are one of the main reasons for diabetic patient admissions to hospital. Osteomyelitis, amputation or death can occur from a diabetic foot ulcer.** Because of poor circulation and neuropathy in the feet, cuts or blisters can easily turn into ulcers that become infected and will not heal. This is a common—and serious—complication of diabetes and can lead to a loss of the foot, the leg or life. Osteomyelitis is the most common complication of diabetic foot ulcers and/or diabetic foot infections.

Irritant dermatitis

- **Perigenital irritant dermatitis, due to urinary and/or faecal incontinence, is another common problem.** Despite the best of intentions, plus-size individuals may not be able to toilet effectively. Large skin folds, a pannus grade 3-5, or excess hip tissue may impede access for self-care. Urine or faeces left on the skin can contribute to skin breakdown.

Lymphoedema

- **Lymphoedema is caused by impaired flow of the lymphatic system. The lymphatic system is a network of specialised vessels (lymph vessels) throughout the body that's purpose is to collect excess lymph fluid with proteins, lipids and waste products from the tissues.** This fluid is then carried to the lymph nodes where waste products are filtered and infection-fighting cells called lymphocytes are contained. The excess fluid in the lymph vessels is eventually returned to the bloodstream. When the lymph vessels are blocked or unable to carry lymph fluid away from the tissues, localised swelling (lymphoedema) is the result. Treatment for lymphoedema should aim to reduce limb size, promote lymph drainage and prevent infection. Cellulitis and skin breakdown can be avoided by daily cleansing with mild soap and water, using compression socks/stockings or compression wraps and elevating the affected limb. It is always important to ask someone who presents with lymphoedema if they have been referred to a lymphoedema specialist as ongoing treatment will be required.



Skin problems (continued)

Intertrigo (Intertriginous dermatitis)

- **Intertrigo is an infectious or noninfectious inflammatory condition of two opposed skin surfaces. The maceration of the skin due to excess moisture and friction can occur within deep skin folds, or more commonly, under a large abdominal pannus.** This may progress to more intense inflammation with erosions, oozing, fissures, exudation, maceration, and crusting. These intertriginous fissures can be several inches in length and painful due to their depth. Risk factors for intertrigo, and especially its most common form candida (fungal) intertrigo, include obesity, hyperhidrosis (excessive sweating), diabetes, incontinence and certain medications

Necrotising fasciitis

- **Most commonly referred to as the flesh-eating disease, necrotising fasciitis is a severe disease with sudden onset that spreads rapidly.** Typically, the infection enters the body through a cut or break in the skin and people commonly complain of severe pain which may seem excessive given the external appearance of the skin. It can be classified into four categories and treatment is normally debridement (cutting away) of the skin. Prevention is possible through a skin care regime and regular handwashing. A person is more at risk of developing necrotising fasciitis if they are morbidly obese and suffer with type 2 diabetes.

Cellulitis

- **Cellulitis is a bacterial infection affecting the inner layers of the skin, namely the dermis and subcutaneous tissue. Typical signs and symptoms are an area that is red, hot and painful.** Diabetics are more susceptible to cellulitis than the general population because of impairment of the immune system; they are especially prone to cellulitis in the feet as the disease causes impairment of blood circulation in the legs, leading to diabetic foot or foot ulcers. Poor control of blood glucose levels allows bacteria to grow more rapidly in the affected tissue and facilitates rapid progression if the infection enters the bloodstream. Therapy for cellulitis involves good skin cleansing, possible topical antimicrobial therapy using advanced dressings for open wounds, and systemic antibiotic therapy.

References

- Beitz, J. M. Providing Quality Skin and Wound Care for the Bariatric Patient: An Overview of Clinical Challenges. *Ostomy Wound Management*, 2014.
- Blickenstorfer, C. H. Bariatric Ergonomics – Transfer and Mobility of the Obese Patient. NAAFA, 2002.
- Brizell, J., Stuart, J., McVeigh, J. & Irvine, F. Evaluation of the Bariatric Care Pathway: Prospective Patients. NHS Wirral, 2012.
- Burlis, T. L. Physical Therapy for the Client Pre/ Post-Bariatric Surgery. Washington University Program in Physical Therapy, 2010.
- Camden, S. G. What is Bariatrics? *Ostomy Wound Management*, 2008.
- Clark, F., Reingold, F. S. & Salles-Jordan, K. Obesity and Occupational Therapy (Position Paper). *The American Journal of Occupational Therapy*, 2017.
- Camden, G. Does skin care for the obese patient require a different approach? Roundtable discussion. *Bariatric Nurse Surgery Patient Care*, 2006.
- Cohen, M. H., et al. Patient handling and movement assessments: A white paper. *Facilities Guidelines Institute*, 2010.
- Costanho, R. & Oliveira, G. B. Major Dermatological Changes in Obese Patients. *ABCD Arq Bras Cir Dig*, 2011.
- Cowdell, F. & Radley, K. Skin hygiene for patients with bariatric needs. *Nursing Practice Review*, 2014.
- Cowley, S. & Leggett, S. Manual handling risks associated with the care, treatment and transport of bariatric (severely obese) patients and clients in Australia. *Australian Safety & Compensation Council*, 2009.
- Dionne, M. Evaluation of the Bariatric Patient (Key Considerations). *Bariatric Inservice*, 2010.
- Dyck, S., Rodrigue, A. & Lim, P. L. Special Considerations for Care of Obese Patients. *Victoria General Hospital*, 2008.
- Froehlich-Grobe, K. & Lollar, D. Obesity and Disability: Time to Act. *American Journal of Preventive Medicine*, 2011.
- Gallagher, S. Obesity and the Aging Adult: ideas for promoting patient safety and preventing caregiver injury. *Clinics in Geriatric Medicine*, 2005.
- Gallagher, S. Obesity: An Emerging Concern for Patients and Nurses. *The Online Journal of Issues in Nursing*, 2009.
- Gallagher, S. Panniculectomy: Implications for Care. *Perspectives*, 2008.
- Gallagher, S. The Challenges of Obesity and Skin Integrity. *Elsevier Saunders*, 2005.
- Hahler, B. Morbid Obesity: A nursing Care challenge. *MEDSURG Nursing*, 2002.
- Hignett, S., Chipchase, S., Tetley, A. & Griffiths, P. Risk Assessment and Process, 2007.
- Hillenbrand, A., Henne-Bruns, D. & Wolf, A. M. Panniculus, giant hernias and surgical problems in patients with morbid obesity. *GMS Interdisciplinary Plastic and Reconstructive Surgery*, 2012.
- Kramer-Jackman, K. & Kramer, D. Bariatric Hospital Bed Safety and Selection. *Bariatric Nursing and Surgical Patient Care*, 2010.
- Krasner, D.L., Kennedy-Evans K.L., Henn, T. et al. Bariatric Wound Care: Common Problems and Management Strategies. *Bariatric Times*, 2006.
- Krasner, D.L., Rodeheaver, G.T. & Sibbald, R.G. *Chronic Wound Care: A Clinical Source Book for Healthcare Professionals*. HMP Communications, 2007.
- Kroll, K. Evidence-based design in healthcare facilities. *Building Operating Management*, 2005.
- Lange, M. L. & Minkel, J. L. *Seating and Wheeled Mobility - A Clinical Resource Guide*. SLACK Incorporated, 2018.
- Lawson, B. Evidence based design in healthcare. *Business Briefing: Hospital Engineering & Facilities Management*, 2005.
- Levine, J. M. Considerations in Special Populations: Patients with Vulnerable Skin. *National Pressure Ulcer Advisory Panel*, 2015.
- Lowe, J. R. Skin Integrity in Critically Ill Obese Patients. *National Institute of Health*, 2009.
- Malone, E. & Dellinger, B. Furniture design features and healthcare outcomes. *The Center for Health Design*, 2011.
- Mastrogiovanni, D., Phillips, E.M. & Fine, C.K. The bariatric spinal cord – injured person: challenges in preventing and healing skin problems. *Top Spinal Cord Injury Rehabil*, 2003.
- Matsumoto, M., Ogai, K., Aoki, M., Yokogawa, M., Tawara, M., Sugama, J., Minematsu, T., Nakagami, G., Dai, M. & Sanada, H. Relationship between Dermal Structural Changes on Ultrasonographic Images and Skin Viscoelasticity in Overweight and Obese Japanese Males. *Scientific Research Publishing*, 2016.
- McClean, K. M., Kee, F., Young, I. S. & Elborn, J. S. Obesity and the lung: *Epidemiology. Thorax*, 2008.
- Morello, S. S. Considerations for Bariatric Patients in Pressure Injuries and Wound Care. *National Pressure Ulcer Advisory Panel*, 2017.
- Muir, M. & Archer-Heese, G. Essentials of a Bariatric Patient Handling Program. *American Nurses Association*, 2009.
- Muir, M. & Rush, A. Moving and handling of plus size people – an illustrated guide. *A National Back Exchange Publication*, 2013.
- Owens, K. Treatment/ Transport of Bariatric Patients. *Globe Manufacturing*, 2012.
- Palfreyman, S. The Impact of Obesity on the Development and Care of Acute and Chronic Wounds. *Wound Care Canada*, 2016.
- Parkyn, W. R., Chan, C. Y. & Rij, A. M. V. Skin Problems in the Lower Legs of Morbidly Obese Patients and the Possible Role of Bariatric Surgery. *Journal of Obesity & Weight Loss Therapy*, 2014.
- Pelczarski, K. Basic concerns in bariatrics. *Healthcare Design Magazine*, 2007.
- Pokorny, M.E. Lead in skin physiology and disease in the obese. *Bariatric Nursing Surgery Patient Care*, 2008.
- Pokorny, M. E., Scott, E., Rose, M. A., Baker, G., Seanson, M., Waters, W., Watkins, F. & Drake, D. Challenges in Caring for Morbidly Obese Patients. *Home Healthcare Nurse*, 2009.
- Reingold, F. S. Obesity and Occupational Therapy. *The American Journal of Occupational Therapy*, 2013.
- Rolin, S. The right to drive: Wheelchair prescription with transportation in mind. *HomeHealthCare®*.
- Rush, A. Bariatric Care: Pressure Ulcer Prevention. *Wound Essentials*, 2009.
- Shoemaker, S. & Stoessel, K. Pressure Ulcers in the Surgical Patient. *Kimberly-Clark Health Care Education*, 2007.
- Smith, A. Considerations in the care of the Bariatric Patient. *PT, DPT*, 2016.
- Strongwater, D. & Becker, F. The Inclusion of the Bariatric Population - Providing greater patient access at a community based hospital, 2009.
- Stapleton, P. A., James, M. E., Goodwill, A. G. & Frisbee, J. C. Obesity and Vascular Dysfunction. *Pathophysiology*, 2009.
- Taylor, S. J. Seating and Mobility Considerations for the Bariatric Client. *Directions Clinical Corner*, 2013.
- The Lancet. *China Medical Board: a century of Rockefeller health Philanthropy*, 2014.
- Tsigos, C., Hainerb, V., Basdevantc, A., Finerd, N., Friede, M., Mathus-Vliegenf, E., Micicg, D., Maislosh, M., Romani, G., Schutzj, Y., Toplakk, H. & Zahorska- Markiewiczl, B. Management of Obesity in Adults: *European Clinical Practice Guidelines*. For the Obesity Management Task Force of the European Association for the Study of Obesity, 2008.
- Traves, K. P., Studdiford, J. S., Pickle, S. & Tully, A. S. Edema: Diagnosis and Management. *America Academy of family Physicians*, 2013.
- Villela, N. R., Kramer- Aguiar, L. G., Bottino, D. A., Wiernsperger, N. & Bouskela, E. Metabolic disturbances linked to obesity: the role of impaired tissue perfusion. *Arq Bras Endocrinol Metab*, 2009.
- Vollmann, K., Garcia, R. & Miller, L. *Interventional Patient Hygiene: Proactive (Hygiene) Strategies to Improved Patients' Outcomes*. AACN, 2005.
- Watanade, L. The Anatomy of Bariatric Mobility. *Mobility Management*, 2010.
- Wignall, D. Design as a Critical Tool in Bariatric Patient Care. *Journal of Diabetes Science and Technology*, 2008.
- Williams, D. S. Design with dignity: The design and manufacture of appropriate furniture for the bariatric patient population. *Bariatric Nursing and Surgical Patient Care*, 2008.
- World Health Organization. Obesity: Preventing and Managing the Global Epidemic. *Report of the World Health Organisation Consultation on Obesity*, 2000.
- Yumuk, V., Tsigos, C., Fried, M., Schindler, K., Busetto, L., Micic, D. & Toplak, H. *European Guidelines for Obesity*. *The European Journal of Obesity*, 2015.