PMB definition guideline for uncomplicated hernias in patients below 18 years & hernias with obstruction and/or gangrene.

Disclaimer:

The uncomplicated hernias & hernias with obstruction and/or gangrene benefit definition has been developed for the majority of standard patients. These benefits may not be sufficient for outlier patients. Therefore regulation 15h and 15l may be applied for patients who are inadequately managed by the stated benefits. The procedure codes are just an indication of applicable procedure codes, however some significant procedure codes may not have been included. The benefit definition does not describe specific in-hospital management such as theatre, anaesthetists, anaesthetist drugs, supportive medication and nursing care. However, these interventions form part of care and are prescribed minimum benefits.

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1. Introduction

The legislation governing the provision of the Prescribed Minimum Benefits (PMBs) is contained in the Regulations enacted under the Medical Schemes Act, No. 31 of 1998 (the Act). With regards to some of the Diagnosis Treatment Pairs (DTPs), medical scheme beneficiaries find it difficult to be fully aware of their entitlements in advance. In addition, medical schemes interpret these benefits differently, resulting in a lack of uniformity of benefit entitlements.

The benefit definition project is undertaken by the Council for Medical Schemes (CMS) with the aim of defining the PMB package, as well as to guide the interpretation of the PMB provisions by relevant stakeholders.

2. Scope and purpose

2.1. This is a recommendation for the diagnosis, treatment and care of individuals with uncomplicated hernias & hernias with obstruction and/or gangrene in any clinically appropriate setting as outlined in the Act.

2.2. Hernia in any age will be a PMB only in the presence of bowel obstruction.

2.3. The purpose is to provide detailed clarification in respect of benefit and entitlements to members and beneficiaries of medical schemes.

Table 1: Possible ICD10 codes for identifying uncomplicated hernias & hernias with obstruction and/or gangrene.

ICD 10 code	*WHO description*
K40.0	Bilateral inguinal hernia, with obstruction, without gangrene
K40.1	Bilateral inguinal hernia, with gangrene
K40.2	Bilateral inguinal hernia, without obstruction or gangrene
K40.3	Unilateral or unspecified inguinal hernia, with obstruction, without gangrene
K40.4	Unilateral or unspecified inguinal hernia, with gangrene
K40.9	Unilateral or unspecified inguinal hernia, without obstruction or gangrene
K41.0	Bilateral femoral hernia, with obstruction, without gangrene
K41.1	Bilateral femoral hernia, with gangrene
K41.2	Bilateral femoral hernia, without obstruction or gangrene

K41.3	Unilateral or unspecified femoral hernia, with obstruction, without gangrene
K41.4	Unilateral or unspecified femoral hernia, with gangrene
K41.9	Unilateral or unspecified femoral hernia, without obstruction or gangrene
K42.0	Umbilical hernia with obstruction, without gangrene
K42.1	Umbilical hernia with gangrene
K42.9	Umbilical hernia without obstruction or gangrene
K43.0	Ventral hernia with obstruction, without gangrene
K43.1	Ventral hernia with gangrene
K43.2	Incisional hernia without obstruction or gangrene
K43.3	Parastomal hernia with obstruction, without gangrene
K43.4	Parastomal hernia with gangrene
K43.5	Parastomal hernia without obstruction or gangrene
K43.6	Other and unspecified ventral hernia with obstruction, without gangrene
K43.7	Other and unspecified ventral hernia with gangrene
K43.9	Ventral hernia without obstruction or gangrene
K45.0	Other specified abdominal hernia with obstruction, without gangrene
K45.1	Other specified abdominal hernia with gangrene
K45.8	Other specified abdominal hernia without obstruction or gangrene
K46.0	Unspecified abdominal hernia with obstruction, without gangrene
K46.1	Unspecified abdominal hernia with gangrene
K46.9	Unspecified abdominal hernia without obstruction or gangrene
Q79.2	Exomphalos
Q79.3	Gastroschisis

- *Please note: ventral and incisional hernias are interchangeable.*
- *Diaphragmatic hernias are still considered PMB, however, diaphragmatic hernias are not included in the current PMB definition as the presentation, diagnosis and management is different to the above mentioned ICD10 codes which are abdominal hernias. The CMS will consider developing a separate PMB definition for diaphragmatic hernias.*

3. Epidemiology and burden of the disease

3.1. A hernia is a defect in the abdominal wall that allows intra-abdominal organs to protrude through. The most common abdominal hernias are groin hernias (inguinal and femoral hernias) and ventral hernias (epigastric umbilical hernia, incisional hernias). These hernias are further classified as primary and secondary hernias, and can be subdivided into midline and lateral hernias.

3.2. The incidence of abdominal wall hernias in different countries varies from 100 - 300/100000 per year (Kingsnorth, 2003). Of the many types of hernias, inguinal hernias are by far the most common. Estimates of groin hernia prevalence in sub-Saharan Africa range from 3.15% to 25%. (Beard, 2013) Although there is no hernia repair data available for South Africa (Oodit, 2015), globally, an estimated 20 million hernia repairs are performed every year (Kingsworth, 2003).

4. Diagnostic Investigations

4.1 Diagnostic investigations in complicated hernias

4.1.1. Generally, a patient who presents with typical signs and symptoms of hernias should not require further imaging for confirmation. History and physical examination remain the best means of diagnosing hernias. Clinical diagnosis can however be difficult, especially in patients with obesity, pain or abdominal wall scarring. In these cases, abdominal imaging may be required to make the correct diagnosis and to confirm suspected complications of hernias.

4.1.2. Imaging should be considered in patients for whom there is diagnostic uncertainty or to exclude other pathology (Simons, 2009).

4.1.3. Ultrasound scan (USS) is recommended as the first line investigation for groin hernias as it distinguishes it from other masses such as cysts, hematomas, neoplasms or varicoceles (Rettenbacher, 2001).

4.1.4. USS for the evaluation of bowel pathology, is regarded as an ideal imaging modality in patients less than 18 years. (Arys et al 2014; Anupindi, 2014; Lobo, 2014) ~~and w~~ Where there is doubt, a magnetic resonance imaging (MRI) or computed tomography (CT) scan can be performed. CT and MRI are not routine and should be motivated for in patients less than 18 years of age.

4.1.5. CT scan is not recommended as a routine investigation in groin hernias.

4.1.6. For complicated ventral or incisional hernias, a CT scan is the most appropriate choice of investigation as its anatomical relations exclude underlying pathology that require treatment, and confirms the diagnosis.

Table 2: Diagnosis basket for complicated hernias.

	Description	Frequency	Comments
Consultations	Primary care practitioner	2	
	Specialists	2	
Laboratory investigations	Blood gas		To assess for acid-base balance.
	FBC		Results are nonspecific, but leucocytosis with left shift may occur with strangulation.
	U&E		Assessment of fluid deficit.
Radiological investigations	Contrast CT scan of abdomen		Ventral hernias require no motivation. Motivation is required for groin hernias as CT is conducted only if there is a clinical indication.
	Ultrasound		For differentiating masses in the groin or abdominal wall or in differentiating testicular swelling.
	X-ray abdomen		To diagnose intestinal obstruction.
	Upright chest X-ray		To identify free air, which is usually a result of bowel perforation.
	Lateral X-ray for patients less than 18 years of age		To identify free air

Please note: Patients with co-morbid diseases impacting on the treatment pathways might require additional consultations, radiology and lab tests; specialist support and extended hospital length of stay.

4.2. Diagnostic investigations for uncomplicated hernias in patients below 18 years

4.2.1. In patients below 18 years, who present with uncomplicated hernias no investigations are required. There is no evidence for the need of any investigations in an uncomplicated hernia as the patient is presumably healthy.

4.2.2. A motivation should be submitted for any clinically indicated tests in patients with underlying conditions.

Table 3: Diagnosis basket for uncomplicated hernias in patients below 18 years

	Description	Frequency
Consultations	Primary care practitioner	2
	Specialists	2

Please note: Patients with co-morbid diseases impacting on the treatment pathways might require additional consultations.

5. Indication for surgical referrals:

5.1. Patients with strangulated, obstructed or gangrenous hernia should be 'emergency referrals' (Bay-Nielsen 2001 & Nilsson 2007).

5.2. All children with uncomplicated hernias should be referred to a pediatric surgical provider or an appropriately skilled general surgeon.

6. Surgical management of complicated hernias in adults

Emergency hernia repair indications for surgery are bowel obstruction, strangulation and perforation. Mortality and morbidity has been reported up to 50% in some studies. The South Africa Hernia interest group (HIG) recommendation is for emergency surgery to be conducted without delay, aiming for the simplest procedure with the lowest complication rate. Complicated hernias are a life-threatening emergency, irrespective of age (Pierides, 2013).

6.1. Complicated groin hernias

6.1.1. Laparoscopic groin hernia repair is the treatment of choice for complicated groin hernias, where surgical expertise and equipment are available.

6.1.2. Open anterior or open posterior mesh repairs are also acceptable alternatives for complicated groin hernias.

6.1.3. Tissue repair (suture repair), where no mesh is used, is acceptable in other circumstances when the surgeon is uncomfortable to place a mesh due to contamination concerns.

6.2. Complicated ventral hernias

6.2.1. Emergency indications for surgery are bowel obstruction, strangulation and perforation. Mortality and morbidity are disproportionately high (up to 50% in some studies). Clinical indicators of sepsis and ischemia are not reliable and all patients with bowel obstruction from a hernia should be managed as an emergency (Bougard et al, 2016).

6.2.2. The optimal technique of hernia repair will be influenced by the anatomy, patient comorbidities, and the degree of contamination of the operative field (Liang, 2016).

6.2.3. Ventral hernias are repaired using either open surgery or minimal access laparoscopic techniques. With a lower rate of wound infections, compared to open repair, laparoscopic ventral hernia surgery is an acceptable alternative where the surgeon has expertise and equipment is available (Eker, 2013, Colavita, 2012).

6.2.4. Laparoscopic repair results in significantly less surgical site infection for all ventral hernias (Zhang, 2014, Sauerland, 2011, Arita, 2015).

7. Surgical management of hernias in patients less than 18 years of age

7.1. Uncomplicated groin hernias

7.1.1. An inguinal hernia will not close spontaneously, and must be repaired, in patients below 18 years of age. While repair is not a surgical emergency, prompt referral to a pediatric surgeon is recommended.

7.1.2. In patients with uncomplicated inguinal or femoral hernias, surgical repair is intended to relieve symptoms and to prevent future complications. Patients with significant symptoms attributable to an inguinal hernia should undergo elective surgical repair (Rosenberg 2011).

7.1.3. Although ~~a~~ herniotomy is the operation of choice and is adequate in the majority of patients, there may be a need to consider a mesh repair. In patients below 18 years of age, with large defects, the internal ring may be stretched and widened, necessitating the tightening of the deep ring after herniotomy and/or strengthening of the posterior wall with a mesh (herniorrhaphy or hernioplasty).

7.1.4. With older children, the internal ring is usually stretched and widened and it is necessary to tighten the deep ring after herniotomy and or strengthen the posterior wall with a mesh (herniorrhaphy or hernioplasty).

7.2. Uncomplicated ventral hernias

7.2.1. These are usually primary (umbilical hernia).

7.2.2. Many umbilical hernias are small (<1 to 1.5 cm) and will close spontaneously as the child grows between birth and 4 to 5 years of age, thus eliminating the need for surgical repair. The general consensus therefore is ''watchful wait'' until the age of 4 to 5 years when umbilical hernias can close spontaneously (Zens, 2017).

7.2.3. Simple tissue repair is adequate in most patients but in cases of large defects (>2cm), mesh repair should be considered.

7.3. Complicated groin hernias

7.3.1. Emergency surgery is typically reserved for patients with life-threatening complications of inguinal hernias such as incarceration and strangulation**.** Inguinal hernias are a common condition in infancy (Erdojan, 2013) and the risk of incarceration in paediatric patients is particularly higher in those under 6 months of age and premature infants (Lau, 2007; Zamakhshary, 2008).

7.3.2. Complicated inguinal hernias such as those with irreducibility and obstruction, with or without strangulation are ~~a~~ life-threatening and constitute a surgical emergency.

7.3.3. Open herniotomy is the standard treatment for inguinal hernias (Lloyd,1998) in the paediatric population and is reported successful in up to 85 – 95% of cases (Niedzielski, 2003; Lau, 2007; Kaya, 2006)

7.3.4. Laparoscopic inguinal hernia repair is an acceptable alternative as it has been shown to be safe and effective in the pediatric population (Esposito, 2014; Feng, 2015).

7.3.5. The recurrence rates in open herniotomy in this population are reported at 0.8 – 3.8% and 0.7 – 4.5% in laparoscopic hernia repair (Tsai, 2010).

7.4. Complicated ventral hernias

7.4.1. Premature infants, with low birth weight or congenital anomalies, have a high incidence of congenital hernias.

7.4.2. Omphalocele and gastroschisis are two of the most common congenital malformations of the anterior abdominal wall and are usually diagnosed prior to birth and require specialist paediatric management.

7.4.3. Repair of ventral hernias can be performed by either primary abdominal wall closure, if bowel can be reduced immediately or by a plain mesh (Khaira, 2001; Burger 2006) depending on surgeon's preference. The gold standard is an open repair. However, laparoscopic repair is an acceptable alternative.

7.4.4. Other ventral complicated hernias in patients less than 18 years of age, which present with gangrene or obstructions, are managed the same as in adults.

8. Mesh selection and mesh options for different types of hernia

Different mesh types are available and the selection of an appropriate mesh by a surgeon depends on a variety of factors. Tables 4, 5 and 6 have been adapted from the SA guidelines for the management of ventral guidelines (Bougard et al, 2016).

Table 4: Recommendations for mesh placed intraperitoneal

Type of procedure	State of operation	Recommended	On motivation	Exclusion
Open IPOM (intraperitoneal onlay mesh)	Uncomplicated (in patients below 18 years)	Composite	PTFE, Fully resorbable	Plain mesh, Biologics,
	Complicated	No mesh	Composite, Fully resorbable	PTFE, Plain mesh, biologics
LVHR (laparoscopic ventral hernia repair)	Uncomplicated (in patients below 18 years)	Composite	PTFE, Fully resorbable	Plain mesh, Biologics

(laparoscopic ventral hernia repair)	Clean contaminated	Delayed repair, convert to open retro-rectus	Composite, Fully resorbable	Plain mesh, PTFE, biologics
	Contaminated	Delayed repair, or convert to open retro-rectus	Fully resorbable	Composite, PTFE, Plain mesh, biologics
	Dirty contaminated	Delayed repair		All

Please note: plain mesh refers to uncoated polypropylene, polyester or PVDF (polyvinyl diethylene fluoride) mesh

Table 5: Recommendations for mesh placed in extraperitoneal position

VHWG 2013 grade	Risk Factors	Recommended	On motivation	Exclusion
Grade 1: Low risk	Low risk No history of wound infections	Plain mesh	Fully absorbable	Composite, Biologic, PTFE
Grade 2: Intermediate risk	Co-morbidities: Smoker, obese, diabetic, COPD, previous wound infection	Plain mesh	Fully absorbable	Composite, Biologic, PTFE
Grade 3A	Clean contaminated	No mesh	Plain Mesh, Fully absorbable, Biologic	Composite, PTFE
Grade 3B	Contaminated	No mesh	Fully absorbable, Biologic	Composite, PTFE
Grade 3C	Dirty contaminated	No mesh	Fully absorbable	Composite, Biologic, PTFE

Please note: plain mesh refers to uncoated polypropylene, polyester or PVDF (polyvinyl diethylene fluoride) mesh

Table 6: Recommendations for mesh types in groin repair

Approach	Recommended	On motivation	Exclusion
Laparoscopic	Plain mesh Anatomical Mesh Self-adhesive mesh	Titanium coated or PVDF mesh	Composite, Biologic, PTFE
Open Anterior	Plain mesh, self-adhesive mesh	Fully absorbable, PVDF	Composite, Biologic, PTFE
Open Posterior	Self-expanding mesh, flat mesh	Fully absorbable mesh	Composite, PTFE, Biologic

Please note: plain mesh refers to uncoated polypropylene, polyester or polyvinyl diethylene fluoride (PVDF) mesh

9. Recommended basket of care for laparoscopic hernia repair

The following surgical equipment is recommended as PMB level of care for laparoscopic repair.

Table 7: Recommended basket of care for laparoscopic hernia repair

	Standard	Difficult	Needing bowel resection
(Transabdominal pre-peritoneal) TAPP	1x10mm port 2x5mm port 1x scissors v-loc / stratafix Mesh	Glue Suture Passer Clip applier Tacker -15 tack device	Endo GIA stapler and reloads (up to 4) or Open GIA stapler and reloads v-loc Suture Energy device

Totally extraperitoneal (TEP)	1x10mm port 2x5mm port Mesh	Endoloop Glue V-loc suture Suture passer	N/A – not done in a dead bowel
LVHR (laparoscopic ventral hernia repair)	1x optic port 11/12mm 2X5mm ports Mesh Tackers Suture passer Ethibond or v-loc or nylon or Prolene	Extra ports (1x 10mm and 2x 5mm) Haemostatic agent	Endo GIA and reloads (up to 4) Open GIA and reloads Suture such as vicryl Energy device
Patients less than 18 years of age	3 ports Suture		

10. Special considerations for the management of complications

10.1. Bowel resection may be required for emergency surgical procedures. There are various types of complications that might need to be addressed when performing a hernia surgical repair e.g. anastomosis, stoma.

10.2. Intra-abdominal tissue could be compromised including bowel omentum, bladder and ~~more~~ rarely, other organs.

10.3. Resection, anastomosis and exteriorization may be required under these circumstances.

10.4. Critical care support is often required in complicated cases, with the involvement of other specialists.

10.5. Tissue repair (suture repair) is acceptable where the surgeon is uncomfortable to place a mesh due to contamination concerns.

10.6. Relook surgery to deal with septic complications or early post -operative complications may be required.

11. Treatment basket for hernias

Table 8 below shows the basket of care for the surgical procedure for hernias.

	Description	Frequency	Comments
Treating providers	Primary surgeon	1	
	Assistant surgeon	1	
	Anaesthesiologist	1	Fee should include pre-and post-operative management
	Supporting specialists	As required during hospital admission	
Laboratory and radiology investigations	Investigations have already been done under diagnosis but when required on a case by case basis as clinically indicated, lab and radiology investigations should be covered.		

Please note: Patients with co-morbid diseases impacting on the treatment pathways might require additional consultations, radiology and lab tests; specialist support and extended hospital length of stay.

12. Consideration of antibiotic prophylaxis for any surgical patient

12.1. The goal of antibiotic prophylaxis is to reduce the intraoperative level of microorganisms. Antibiotics are given based on risk factors, not the procedure.

12.2. There is consensus on the use of a single dose of a first-generation cephalosporin given intravenously, directly before making the incision in complicated hernias (Bratzler, 2013).

12.3. The prophylaxis is expanded to include subsequent doses if the procedure takes longer than 4 hours or there is significant blood loss (> 1.5 litres) (Zanetti, 2001).

12.4. If a patient is allergic to beta-lactams, alternative antibiotics are clindamycin or vancomycin.

12.5. Metronidazole is recommended for anaerobic cover in the setting of bowel entrapment.

12.6. Routine antibiotic prophylaxis is not indicated in uncomplicated hernias for patients below 18 years (Platt, 1990; Lewi, 1995; D'Amico, 2001).

13. Post-operative care

13.1. Routine outpatient follow-up is not required after groin hernia repair.

13.2. Ventral hernias are routinely followed up 1 month after surgery.

13.3. Hernias in patients below 18 years of age are also not routinely followed up.

13.4. Follow-up is recommended when a patient has complications post procedure.

Table 9: Post-operative care basket of care

Description	Comments
Regular follow-up within one month post-operatively is included within the surgical fee	
Primary practitioner visits	0
Specialist	1
Analgesia and antibiotics	As per formulary

This guideline will be due for update on 31 March 2020

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