

Non-pharmacological Options in post-operative Hospital-based And Rehabilitation pain Management
(NOHARM): Protocol for a stepped-wedge cluster-randomized pragmatic clinical trial

Authorship

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Appendix 1. CPT Procedure Codes Used to Assign Patients to the NOHARM Registry by Surgical Specialty

Orthopedic Procedure Codes

TSA		
23472	Arthroplasty, glenohumeral joint; total shoulder (glenoid and proximal humeral replacement (eg, total shoulder))	
THA		
27130	Arthroplasty, acetabular and proximal femoral prosthetic replacement (total hip arthroplasty), with or without autograft or allograft	
TKA		
27447	Arthroplasty, knee, condyle and plateau; medial AND lateral compartments with or without patella resurfacing (total knee arthroplasty)	
Above-knee amputation		
27590	Amputation, thigh, through femur, any level	
27591	Amputation, thigh, through femur, any level; immediate fitting technique including first cast	
27592	Amputation, thigh, through femur, any level; open, circular (guillotine)	
57594	Amputation, thigh, through femur, any level; secondary closure or scar revision	
Below-knee amputation		
27880	Amputation, leg, through tibia and fibula	
27881	Amputation, leg, through tibia and fibula; with immediate fitting technique including application of first cast	
27882	Amputation, leg, through tibia and fibula; open, circular (guillotine)	
Revision THA		
27134	Revision of total hip arthroplasty	
UKA		
27446	Arthroplasty, knee, condyle and plateau	
Revision TKA		
27486	Revision of total knee arthroplasty	
Colorectal Procedure Codes		
Total Colectomy		
44150	Colectomy, total, abdominal, without proctectomy; with ileostomy or ileoproctostomy	
44151	Colectomy, total, abdominal, without proctectomy; with continent ileostomy	
44210	Laparoscopy, surgical; colectomy, total, abdominal, without proctectomy, with ileostomy or ileoproctostomy	
44212	Laparoscopy, surgical; colectomy, total, abdominal, with proctectomy, with ileostomy	
Partial Colectomy		
44160	Colectomy, partial, with removal of terminal ileum with ileocolostomy	
44205	Laparoscopy, surgical; colectomy, partial, with removal of terminal ileum with ileocolostomy	

- 44143 Colectomy, partial; with end colostomy and closure of distal segment (Hartmann type procedure)
- 44206 Laparoscopy, surgical; colectomy, partial, with end colostomy and closure of distal segment (Hartmann type procedure)
- 44140 Colectomy, partial; with anastomosis
- 44141 Colectomy, partial; with skin level cecostomy or colostomy
- 44144 Colectomy, partial; with resection, with colostomy or ileostomy and creation of mucofistula
- 44204 Laparoscopy, surgical; colectomy, partial, with anastomosis

Rectal

- 44145 Colectomy, partial; with coloproctostomy (low pelvic anastomosis)
- 44146 Colectomy, partial; with coloproctostomy (low pelvic anastomosis), with colostomy
- 44147 Colectomy, partial; abdominal and transanal approach
- 44207 Laparoscopy, surgical; colectomy, partial, with anastomosis, with coloproctostomy (low pelvic anastomosis)
- 44208 Laparoscopy, surgical; colectomy, partial, with anastomosis, with coloproctostomy (low pelvic anastomosis) with colostomy
- 45119 Proctectomy, combined abdominoperineal pull-through procedure (eg, colo-anal anastomosis), with creation of colonic reservoir (eg, J-pouch), with diverting enterostomy when performed
- 45397 Laparoscopy, surgical; proctectomy, combined abdominoperineal pull-through procedure (eg, colo-anal anastomosis), with creation of colonic reservoir (eg, J-pouch), with diverting enterostomy, when performed
- 44152 Colectomy, total, abdominal, without proctectomy; with rectal mucosectomy, ileoanal anastomosis, with or without loop ileostomy
- 44155 Colectomy, total, abdominal, with proctectomy; with ileostomy
- 44156 Colectomy, total, abdominal, with proctectomy; with continent ileostomy
- 45111 Proctectomy; partial resection of rectum, transabdominal approach
- 45112 Proctectomy, combined abdominoperineal, pull-through procedure (eg, colo-anal anastomosis)
- 45113 Proctectomy, partial, with rectal mucosectomy, ileoanal anastomosis, creation of ileal reservoir (S or J), with or without loop ileostomy
- 45114 Proctectomy, partial, with anastomosis; abdominal and transsacral approach
- 45116 Proctectomy, partial, with anastomosis; transsacral approach only (Kraske type)
- 45123 Proctectomy, partial, without anastomosis, perineal approach
- 44157 Colectomy, total, abdominal, with proctectomy; with ileoanal anastomosis, includes loop ileostomy, and rectal mucosectomy, when performed

- 44158 Colectomy, total, abdominal, with proctectomy; with ileoanal anastomosis, creation of ileal reservoir (S or J), includes loop ileostomy, and rectal mucosectomy, when performed
- 44211 Laparoscopy, surgical; colectomy, total, abdominal, with proctectomy, with ileoanal anastomosis, creation of ileal reservoir (S or J), with loop ileostomy, includes rectal mucosectomy, when performed
- 44153 Colectomy, total, abdominal, without proctectomy; with rectal mucosectomy, ileoanal anastomosis, creation of ileal reservoir (S or J), with or without loop ileostomy
- 45110 Proctectomy; complete, combined abdominoperineal, with colostomy
- 45395 Laparoscopy, surgical; proctectomy, complete, combined abdominoperineal, with colostomy

Gynecologic Procedure Codes

Laparoscopic Hysterectomy

- 58550 Laparoscopy, surgical, with vaginal hysterectomy, for uterus 250 g or less;
- 58552 Laparoscopy, surgical, with vaginal hysterectomy, for uterus 250 g or less; with removal of tube(s) and/or ovary(s)
- 58553 Laparoscopy, surgical, with vaginal hysterectomy, for uterus greater than 250 g;
- 58554 Laparoscopy, surgical, with vaginal hysterectomy, for uterus greater than 250 g; with removal of tube(s) and/or ovary(s)
- 58570 Laparoscopy, surgical, with total hysterectomy, for uterus 250 g or less;
- 58571 Laparoscopy, surgical, with total hysterectomy, for uterus 250 g or less; with removal of tube(s) and/or ovary(s)
- 58572 Laparoscopy, surgical, with total hysterectomy, for uterus greater than 250 g;
- 58573 Laparoscopy, surgical, with total hysterectomy, for uterus greater than 250 g; with removal of tube(s) and/or ovary(s)
- 58541 Laparoscopy, surgical, supracervical hysterectomy, for uterus 250 g or less;
- 58542 Laparoscopy, surgical, supracervical hysterectomy, for uterus 250 g or less; with removal of tube(s) and/or ovary(s)
- 58543 Laparoscopy, surgical, supracervical hysterectomy, for uterus greater than 250 g
- 58544 Laparoscopy, surgical, supracervical hysterectomy, for uterus great than 250 g; with removal of tube(s) and/or ovary(s)

Vaginal Hysterectomy

- 58260 Vaginal hysterectomy, for uterus 250 g or less;
- 58262 Vaginal hysterectomy, for uterus 250 g or less; with removal of tube(s), and/or ovary(s)
- 58263 Vaginal hysterectomy, for uterus 250 g or less; with removal of tube(s), and/or ovary(s), with repair of enterocele
- 58267 Vaginal hysterectomy, for uterus 250 g or less; with colpo-urethrocystopexy (Marshall-Marchetti-Krantz type, Pereyra type) with or without endoscopic control
- 58270 Vaginal hysterectomy, for uterus 250 g or less; with repair of enterocele

- 58275 Vaginal hysterectomy, with total or partial vaginectomy;
Vaginal hysterectomy, with total or partial vaginectomy; with repair of
58580 enterocele
58285 Vaginal hysterectomy, radical (Schauta type operation)
58290 Vaginal hysterectomy, for uterus greater than 250 g;
Vaginal hysterectomy, for uterus greater than 250 g; with removal of tube(s)
58291 and/or ovary(s)
Vaginal hysterectomy, for uterus greater than 250 g; with removal of tube(s)
58292 and/or ovary(s), with repair of enterocele
Vaginal hysterectomy, for uterus greater than 250 g; with colpo-
urethrocystopexy (Marshall-Marchetti-Krantz type, Pereyra type) with or
58293 without endoscopic control
Vaginal hysterectomy, for uterus greater than 250 g; with repair of
58294 enterocele

Open Hysterectomy

- 58150 Total abdominal hysterectomy (corpus and cervix), with or without removal
of tube(s), with or without removal of ovary(s);

Total abdominal hysterectomy (corpus and cervix), with or without removal
of tube(s), with or without removal of ovary(s); with colpo-urethrocystopexy
58152 (eg, Marshall-Marchetti-Krantz, Burch)

Supracervical abdominal hysterectomy (subtotal hysterectomy), with or
without removal of tube(s), with or without removal of ovary(s)
58180
Total abdominal hysterectomy, including partial vaginectomy, with para-
aortic and pelvic lymph node sampling, with or without removal of tube(s),
58200 with or without removal of ovary(s)

Radical abdominal hysterectomy, with bilateral total pelvic
lymphadenectomy and para-aortic lymph node sampling (biopsy), with or
without removal of tube(s), with or without removal of ovary(s)
58210

Pelvic exenteration

- Pelvic exenteration for gynecologic malignancy, with total abdominal
hysterectomy or cervicectomy, with or without removal of tube(s), with or
without removal of ovary(s), with removal of bladder and ureteral
58240 transplantations, and/or abdominoperineal rese

Vulvectomy

- 56625 Vulvectomy simple; complete
56620 Vulvectomy simple; partial
56630 Vulvectomy, radical, partial
56633 Vulvectomy, radical, complete
Vulvectomy, radical, partial; with unilateral inguinofemoral
56631 lymphadenectomy

56632 Vulvectomy, radical, partial; with bilateral inguinofemoral lymphadenectomy
Vulvectomy, radical, complete; with unilateral inguinofemoral
56634 lymphadenectomy
Vulvectomy, radical, complete; with bilateral inguinofemoral
56637 lymphadenectomy

	56640	Vulvectomy, radical, complete, with inguinofemoral, iliac, and pelvic lymphadenectomy
Vaginectomy	57110	Vaginectomy, complete removal of vaginal wall
	57109	Vaginectomy, partial removal of vaginal wall; with removal of paravaginal tissue (radical vaginectomy) with bilateral total pelvic lymphadenectomy and para-aortic lymph node sampling (biopsy)
	57111	Vaginectomy, complete removal of vaginal wall; with removal of paravaginal tissue (radical vaginectomy)
	57106	Vaginectomy, partial removal of vaginal wall
	57107	Vaginectomy, partial removal of vaginal wall; with removal of paravaginal tissue (radical vaginectomy)
Oophrectomy		
	49255	Omentectomy, epiploectomy, resection of omentum (separate procedure)
Omentectomy		
	49255	Omentectomy, epiploectomy, resection of omentum (separate procedure)
Open debulking		
	49203	Excision or destruction, open, intra-abdominal tumors, cysts or endometriomas, 1 or more peritoneal, mesenteric, or retroperitoneal primary or secondary tumors; largest tumor 5 cm diameter or less
	49204	Excision or destruction, open, intra-abdominal tumors, cysts or endometriomas, 1 or more peritoneal, mesenteric, or retroperitoneal primary or secondary tumors; largest tumor 5.1-10.0 cm diameter
	49205	Excision or destruction, open, intra-abdominal tumors, cysts or endometriomas, 1 or more peritoneal, mesenteric, or retroperitoneal primary or secondary tumors; largest tumor greater than 10.0 cm diameter
	58943	Oophorectomy, partial or total, unilateral or bilateral; for ovarian, tubal or primary peritoneal malignancy, with para-aortic and pelvic lymph node biopsies, peritoneal washings, peritoneal biopsies, diaphragmatic assessments, with or without salpingectomy(s), with or without omentectomy
	58950	Resection (initial) of ovarian, tubal or primary peritoneal malignancy with bilateral salpingo-oophorectomy and omentectomy
	58951	Resection (initial) of ovarian, tubal or primary peritoneal malignancy with bilateral salpingo-oophorectomy and omentectomy; with total abdominal hysterectomy, pelvic and limited para-aortic lymphadenectomy
	58952	Resection (initial) of ovarian, tubal or primary peritoneal malignancy with bilateral salpingo-oophorectomy and omentectomy; with radical dissection

for debulking (ie, radical excision or destruction, intra-abdominal or retroperitoneal tumors)

58953 Bilateral salpingo-oophorectomy with omentectomy, total abdominal hysterectomy and radical dissection for debulking

58954 Bilateral salpingo-oophorectomy with omentectomy, total abdominal hysterectomy and radical dissection for debulking; with pelvic lymphadenectomy and limited para-aortic lymphadenectomy

58956 Bilateral salpingo-oophorectomy with total omentectomy, total abdominal hysterectomy for malignancy

58957 Resection (tumor debulking) of recurrent ovarian, tubal, primary peritoneal, uterine malignancy (intra-abdominal, retroperitoneal tumors), with omentectomy, if performed

58958 Resection (tumor debulking) of recurrent ovarian, tubal, primary peritoneal, uterine malignancy (intra-abdominal, retroperitoneal tumors), with omentectomy, if performed; with pelvic lymphadenectomy and limited para-aortic lymphadenectomy

58960 Laparotomy, for staging or restaging of ovarian, tubal, or primary peritoneal malignancy (second look), with or without omentectomy, peritoneal washing, biopsy of abdominal and pelvic peritoneum, diaphragmatic assessment with pelvic and limited para-aortic lymphadenectomy

Obstetrics Procedure Codes

C-Section

59514 Cesarean delivery only

59515 Cesarean delivery only; including postpartum care

Pulmonary/Thoracic Procedure Codes

Open Lung Lobectomy

32480 Removal of lung, other than pneumonectomy; single lobe (lobectomy)

32482 Removal of lung, other than pneumonectomy; 2 lobes (bilobectomy)

32484 Removal of lung, other than pneumonectomy; single segment (segmentectomy)

32488 Removal of lung, other than pneumonectomy; with all remaining lung following previous removal of a portion of lung (completion pneumonectomy)

32491 Removal of lung, other than pneumonectomy; with resection-plication of emphysematous lung(s) (bullous or non-bullous) for lung volume reduction, sternal split or transthoracic approach, includes any pleural procedure, when performed

Pneumonectomy	
32440	Removal of lung, pneumonectomy
32442	Removal of lung, pneumonectomy; with resection of segment of trachea followed by broncho-tracheal anastomosis (sleeve pneumonectomy)
32445	Removal of lung, pneumonectomy; extrapleural
32671	Thoracoscopy, surgical; with removal of lung (pneumonectomy)
Wedge Resection	
32505	Thoracotomy; with therapeutic wedge resection (eg, mass, nodule), initial
32506	Thoracotomy; with therapeutic wedge resection (eg, mass or nodule), each additional resection, ipsilateral (List separately in addition to code for primary procedure)
32507	Thoracotomy; with diagnostic wedge resection followed by anatomic lung resection (List separately in addition to code for primary procedure)
32666	Thoracoscopy, surgical; with therapeutic wedge resection (eg, mass, nodule), initial unilateral
32667	Thoracoscopy, surgical; with therapeutic wedge resection (eg, mass or nodule), each additional resection, ipsilateral (List separately in addition to code for primary procedure)
32668	Thoracoscopy, surgical; with diagnostic wedge resection followed by anatomic lung resection (List separately in addition to code for primary procedure)
Thoracotomy	
32096	Thoracotomy, with diagnostic biopsy(ies) of lung infiltrate(s) (eg, wedge, incisional), unilateral
32097	Thoracotomy, with diagnostic biopsy(ies) of lung nodule(s) or mass(es) (eg, wedge, incisional), unilateral
Thoracic Lymphadenectomy by Thoracotomy	
38746	Thoracic lymphadenectomy by thoracotomy, mediastinal and regional lymphadenectomy (List separately in addition to code for primary procedure)
Transplant Procedure Codes	
Liver Transplant	
47135	Liver allotransplantation, orthotopic, partial or whole, from cadaver or living donor, any age
Kidney Transplant	
50360	Renal allotransplantation, implantation of graft; without recipient nephrectomy
50365	Renal allotransplantation, implantation of graft; with recipient nephrectomy
50320	Donor nephrectomy (including cold preservation); open, from living donor
50547	Laparoscopy, surgical; donor nephrectomy (including cold preservation), from living donor
Pancreas Transplant	

48554 Transplantation of pancreatic allograft

Cardiac Procedure Codes

CABG

- 33510 Coronary artery bypass, vein only; single coronary venous graft
- 33511 Coronary artery bypass, vein only; 2 coronary venous grafts
- 33512 Coronary artery bypass, vein only; 3 coronary venous grafts
- 33513 Coronary artery bypass, vein only; 4 coronary venous grafts
- 33514 Coronary artery bypass, vein only; 5 coronary venous grafts

- 33516 Coronary artery bypass, vein only; 6 or more coronary venous grafts

- 33533 Coronary artery bypass, using arterial graft(s); single arterial graft
- 33534 Coronary artery bypass, using arterial graft(s); 2 coronary arterial grafts
- 33535 Coronary artery bypass, using arterial graft(s); 3 coronary arterial grafts
- 33536 Coronary artery bypass, using arterial graft(s); 4 or more coronary arterial grafts

- 33517 Coronary artery bypass, using venous graft(s) and arterial graft(s); single vein graft (List separately in addition to code for primary procedure)

- 33518 Coronary artery bypass, using venous graft(s) and arterial graft(s); 2 venous grafts (List separately in addition to code for primary procedure)

- 33522 Coronary artery bypass, using venous graft(s) and arterial graft(s); 5 venous grafts (List separately in addition to code for primary procedure)
- 33523 Coronary artery bypass, using venous graft(s) and arterial graft(s); 6 or more venous grafts (List separately in addition to code for primary procedure)

- 33519 Coronary artery bypass, using venous graft(s) and arterial graft(s); 3 venous grafts (List separately in addition to code for primary procedure)

- 33521 Coronary artery bypass, using venous graft(s) and arterial graft(s); 4 venous grafts (List separately in addition to code for primary procedure)

Cardiac Other: Requiring Sternotomy

- 33120 Excision of intracardiac tumor, resection with cardiopulmonary bypass
- 33130 Resection of external cardiac tumor
- 33405 Replacement, aortic valve, open, with cardiopulmonary bypass; with prosthetic valve other than homograft or stentless valve
- 33406 Replacement, aortic valve, open, with cardiopulmonary bypass; with allograft valve (freehand)
- 33410 Replacement, aortic valve, open, with cardiopulmonary bypass; with stentless tissue valve
- 33411 Replacement, aortic valve; with aortic annulus enlargement, noncoronary sinus
- 33412 Replacement, aortic valve; with transventricular aortic annulus enlargement (Konno procedure)

33413 Replacement, aortic valve; by translocation of autologous pulmonary valve with allograft replacement of pulmonary valve (Ross procedure)
 33417 Aortoplasty (gusset) for supraaortic stenosis
 33425 Valvuloplasty, mitral valve, with cardiopulmonary bypass
 33426 Valvuloplasty, mitral valve, with cardiopulmonary bypass; with prosthetic ring
 33427 Valvuloplasty, mitral valve, with cardiopulmonary bypass; radical reconstruction, with or without ring
 33430 Replacement, mitral valve, with cardiopulmonary bypass
 33542 Myocardial resection (eg, ventricular aneurysmectomy)

 33600 Closure of atrioventricular valve (mitral or tricuspid) by suture or patch

 33602 Closure of semilunar valve (aortic or pulmonary) by suture or patch
 Repair of cor triatriatum or supraaortic mitral ring by resection of left atrial membrane
 33732 Repair of left ventricular outflow tract obstruction by patch enlargement of the outflow tract
 33414 Ventriculomyotomy (-myectomy) for idiopathic hypertrophic subaortic stenosis (eg, asymmetric septal hypertrophy)
 33416 Percutaneous balloon valvuloplasty; aortic valve
 92986 Valvuloplasty, aortic valve, open, with cardiopulmonary bypass; simple (ie, valvotomy, debridement, debulking, and/or simple commissural resuspension)
 33390 Valvuloplasty, aortic valve, open, with cardiopulmonary bypass; complex (eg, leaflet extension, leaflet resection, leaflet reconstruction, or annuloplasty)
 33391 Valvuloplasty, aortic valve; open, with cardiopulmonary bypass
 33400 Valvuloplasty, aortic valve; open, with inflow occlusion
 33401 Valvuloplasty, aortic valve; using transventricular dilation, with cardiopulmonary bypass
 33403 Valvotomy, mitral valve; closed heart
 33420 Valvotomy, mitral valve; open heart, with cardiopulmonary bypass
 33422