

Supplementary Table 1 Medications for primary *Helicobacter pylori* eradication therapy covered by health insurance

1. Combination pack	
Drug code	Drug name
610462048	Lansap 400
610462049	Lansap 800
622289101	Rabecure Pack 400
622289201	Rabecure Pack 800
622485401	Vonosap Pack 400
622485501	Vonosap Pack 800
2. Combination prescription (each one drug from A, B, and C on the same day)	
A. Proton pump inhibitor or potassium-competitive acid blocker	
Drug code	Drug name
610462010	Takepron OD Tablets 15 15mg
610462011	Takepron OD Tablets 30 30mg
612320549	Takepron Capsules 15 15mg
612320550	Takepron Capsules 30 30mg
620002749	Tapizol Capsules 15 15mg
620002750	Tapizol Capsules 30 30mg
620002871	Lansoprazole Capsules 15mg (AMEL)
620002872	Lansoprazole Capsules 30mg (AMEL)
620004087	Lansoprazole Capsules 15mg (MED)
620004088	Lansoprazole Capsules 30mg (MED)
620005581	Lansoprazole OD Tablets 15mg (DK)
620005583	Lansoprazole OD Tablets 30mg (DK)

Supplementary Table 1 (continued)

Drug code	Drug name
620005584	Lansoprazole Capsules 15mg (TAKATA)
620005585	Lansoprazole Capsules 30mg (TAKATA)
620007127	Lansoprazole Capsules 15mg (TOWA)
620007128	Lansoprazole Capsules 30mg (TOWA)
620009451	Lansoprazole OD Tablets 15mg (TOWA)
620009452	Lansoprazole OD Tablets 30mg (TOWA)
621673701	Lansoprazole Capsules 15mg (NICHIIKO)
621673801	Lansoprazole Capsules 30mg (NICHIIKO)
621693101	Lansoprazole Capsules 15mg (SAWAI)
621693201	Lansoprazole Capsules 30mg (SAWAI)
621743701	Lansoprazole Capsules 15mg (CHEMIPHAR)
621743801	Lansoprazole Capsules 30mg (CHEMIPHAR)
621780301	Lansoprazole OD Tablets 15mg (TEVA)
621780303	Lansoprazole OD Tablets 15mg (TAKEDA TEVA)
621780401	Lansoprazole OD Tablets 30mg (TEVA)
621780403	Lansoprazole OD Tablets 30mg (TAKEDA TEVA)
621796301	Lansoprazole OD Tablets 15mg (CHEMIPHAR)
621796401	Lansoprazole OD Tablets 30mg (CHEMIPHAR)
621919001	Lansoprazole OD Tablets 15mg (SAWAI)
621919101	Lansoprazole OD Tablets 30mg (SAWAI)
622015801	Lansoprazole Capsules 15mg (JG)
622015901	Lansoprazole Capsules 30mg (JG)

Supplementary Table 1 (continued)

Drug code	Drug name
622023101	Lansoprazole OD Tablets 15mg (JG)
622023201	Lansoprazole OD Tablets 30mg (JG)
622034601	Lansoprazole OD Tablets 15mg (NICHIIKO)
622034701	Lansoprazole OD Tablets 30mg (NICHIIKO)
622469801	Lansoprazole OD Tablets 15mg (RTO)
622469901	Lansoprazole OD Tablets 30mg (RTO)
622617200	Lansoprazole 30mg Tablets
620002743	Taiproton Capsules 15mg
610443068	Omeprazon Tablets 10mg
610443069	Omeprazon Tablets 20mg
610443070	Omepral Tablets 10 10mg
610443071	Omepral Tablets 20 20mg
620001983	Omeprazole Tablets (TOWA) 10mg
620001984	Omeprazole Tablets (TOWA) 20mg
620001985	Omeprazole Tablets 20 (SW) 20mg
620001986	Omeprazole Tablets 20mg (AMEL)
620002694	Omeprazole Tablets 10mg (AMEL)
620002695	Omeprazole Tablets 20mg (TSU)
620003914	Omeprazole Tablets 10 (SW) 10mg
621622303	Omeprazole Enteric-coated Tablets 10mg (TAKEDA TEVA)
621622403	Omeprazole Enteric-coated Tablets 20mg (TAKEDA TEVA)
621630104	Omeprazole Tablets 20mg (TYK)

Supplementary Table 1 (continued)

Drug code	Drug name
621630502	Omeprazole Enteric-coated Tablets 20mg (MYLAN)
621630601	Omeprazole Tablets 10mg (NICHIIKO)
621630701	Omeprazole Tablets 20mg (NICHIIKO)
621680901	Omeprazole Tablets 10mg (CHEMIPHAR)
621681001	Omeprazole Tablets 20mg (CHEMIPHAR)
621681401	Omeprazole Tablets 20mg (MED)
621794301	Omeprazole Tablets 10mg (MED)
621977902	Omeprazole Enteric-coated Tablets 10mg (MYLAN)
621983103	Omeprazole Tablets 10mg (TYK)
622077801	Omeprazole Tablets 10mg (TSU)
610412202	Pariet Tablets 10mg
610412203	Pariet Tablets 20mg
621997201	Rabeprazole Na Tablets 10mg (BMD)
621997301	Rabeprazole Na Tablets 20mg (BMD)
621999501	Rabeprazole Na Tablets 10mg (OHARA)
621999601	Rabeprazole Na Tablets 20mg (OHARA)
621999901	Rabeprazole Na Tablets 10mg (YD)
622000001	Rabeprazole Na Tablets 20mg (YD)
622001201	Rabeprazole Na Tablets 10mg (AMEL)
622001301	Rabeprazole Na Tablets 20mg (AMEL)
622002201	Sodium Rabeprazole Tablets 10mg (TCK)
622002301	Sodium Rabeprazole Tablets 20mg (TCK)

Supplementary Table 1 (continued)

Drug code	Drug name
622005301	Rabeprazole Na Tablets 10mg (NISSIN)
622005401	Rabeprazole Na Tablets 20mg (NISSIN)
622007301	Rabeprazole Na Tablets 10mg (MEIJI)
622007401	Rabeprazole Na Tablets 20mg (MEIJI)
622011201	Rabeprazole Na Tablets 10mg (SAWAI)
622011301	Rabeprazole Na Tablets 20mg (SAWAI)
622012901	Rabeprazole Na Tablets 10mg (TOWA)
622013001	Rabeprazole Na Tablets 20mg (TOWA)
622016201	Sodium Rabeprazole Tablets 10mg (KAKEN)
622016301	Sodium Rabeprazole Tablets 20mg (KAKEN)
622020602	Rabeprazole Na Tablets 10mg (TYK)
622020702	Rabeprazole Na Tablets 20mg (TYK)
622021401	Sodium Rabeprazole Tablets 10mg (FFP)
622021501	Sodium Rabeprazole Tablets 20mg (FFP)
622023301	Rabeprazole Na Tablets 10mg (JG)
622023401	Rabeprazole Na Tablets 20mg (JG)
622025601	Sodium Rabeprazole Tablets 10mg (CHEMIPHAR)
622025701	Sodium Rabeprazole Tablets 20mg (CHEMIPHAR)
622026001	Rabeprazole Na Tablets 10mg (AA)
622026101	Rabeprazole Na Tablets 20mg (AA)
622031601	Rabeprazole Na Tablets 10mg (KYORIN)
622031701	Rabeprazole Na Tablets 20mg (KYORIN)

Supplementary Table 1 (continued)

Drug code	Drug name
622032801	Sodium Rabeprazole Tablets 10mg (NP)
622032901	Sodium Rabeprazole Tablets 20mg (NP)
622035501	Sodium Rabeprazole Tablets 10mg (NICHIIKO)
622035601	Sodium Rabeprazole Tablets 20mg (NICHIIKO)
622040101	Sodium Rabeprazole Tablets 10mg (SANDOZ)
622040201	Sodium Rabeprazole Tablets 20mg (SANDOZ)
622060201	Sodium Rabeprazole Tablets 10mg (TAIYO)
622060301	Sodium Rabeprazole Tablets 20mg (TAIYO)
622089501	Rabeprazole Na Tablets 10mg (PFIZER)
622089601	Rabeprazole Na Tablets 20mg (PFIZER)
622118601	Sodium Rabeprazole Tablets 10mg (ZERIA)
622118701	Sodium Rabeprazole Tablets 20mg (ZERIA)
622402601	Pariet Tablets 5mg
622505501	Sodium Rabeprazole Tablets 10mg (NPI)
622505601	Sodium Rabeprazole Tablets 20mg (NPI)
622617000	Sodium Rabeprazole 10mg Tablets
622617100	Sodium Rabeprazole 20mg Tablets
622080701	Nexium Capsules 10mg
622080801	Nexium Capsules 20mg
622624801	Nexium Granules for Suspension Packet 10mg
622624901	Nexium Granules for Suspension Packet 20mg
622404401	Takecab Tablets 10mg

Supplementary Table 1 (continued)

Drug code	Drug name
622404501	Takecab Tablets 20mg
B. Amoxicillin	
Drug code	Drug name
610454003	Amolin Fine Granules 10% 100mg
616130039	Amolin Capsules 125 125mg
616130040	Amolin Capsules 250 250mg
616130132	Sawacillin Tablets 250 250mg
616130295	Pasetocin Tablets 250 250mg
620005906	Amoxicillin Fine Granules 20% (TATSUMI) 200mg
620006829	Amoxicillin Capsules 250mg (TATSUMI)
620006919	Sawacillin Capsules 250 250mg
620006920	Sawacillin Fine Granules 10% 100mg
620007024	Pasetocin Capsules 125 125mg
620007025	Pasetocin Capsules 250 250mg
620007026	Pasetocin Fine Granules 10% 100mg
620008584	Amoxicillin Capsules 250mg (NICHIIKO)
620009117	Amoxicillin Capsules 250mg (TOWA)
621073001	Widecillin Fine Granules 20% 200mg
621073901	Amoxicillin Capsules 250mg (NP)
622054901	Sawacillin Capsules 125 125mg
622066501	Amoxicillin Capsules 125mg (TATSUMI)
622066601	Amoxicillin Fine Granules 10% (TATSUMI) 100mg

Supplementary Table 1 (continued)

Drug code	Drug name
622111101	Amoxicillin Capsules 125mg (TOWA)
622112902	Widecillin Fine Granules 10% 100mg
622127801	Amoxicillin Capsules 125mg (NICHIIKO)
622165902	Amoxicillin Capsules 125mg (NP)
C. Clarithromycin	
Drug code	Drug name
616140101	Klaricid Tablets 50mg for Pediatric
616140102	Klaricid Tablets 200mg
616140104	Clarith Tablets 50 for Pediatric 50mg
616140105	Clarith Tablets 200 200mg
620003916	Clarithromycin Tablets for Pediatric 50mg (TAKATA)
620003917	Clarithromycin Tablets 50 for Pediatric (TCK) 50mg
620003918	Clarithromycin Tablets 50mg for Pediatric (EMEC)
620003919	Clarithromycin Tablets 50mg for Pediatric (NPI)
620003920	Clarithromycin Tablets 50mg for Pediatric (SAWAI)
620003921	Clarithromycin Tablets 50mg for Pediatric (CH)
620003922	Clarithromycin Tablets 50mg for Pediatric (TAIYO)
620003923	Clarithromycin Tablets 50mg for Pediatric (NICHIIKO)
620003926	Clarithromycin Tablets 200 (MEEK) 200mg
620003927	Clarithromycin Tablets 200 (TCK) 200mg
620003928	Clarithromycin Tablets 200mg (EMEC)
620003929	Clarithromycin Tablets 200mg (NPI)

Supplementary Table 1 (continued)

Drug code	Drug name
620003930	Clarithromycin Tablets 200mg (SAWAI)
620003931	Clarithromycin Tablets 200mg (SANDOZ)
620003932	Clarithromycin Tablets 200mg (CH)
620003933	Clarithromycin Tablets 200mg (TAIYO)
620003934	Clarithromycin Tablets 200mg (TAKATA)
620003935	Clarithromycin Tablets 200mg (NICHIIKO)
622659101	Clarithromycin Tablets 200mg (FELDSENF)
621736701	Clarithromycin Tablets 200mg (KAKEN)
620003939	Clarithromycin DS 10% (MEEK) 100mg
620003940	Clarithromycin DS 10% for Pediatric (EMEC) 100mg
620003941	Clarithromycin DS 10% for Pediatric (SAWAI) 100mg
620003942	Clarithromycin DS 10% for Pediatric (NICHIIKO) 100mg
620003943	Clarithromycin DS for Pediatric 10% (TAKATA) 100mg
620003945	Claroycin Tablets 50 for Pediatric 50mg
620003946	Claroycin Tablets 200 200mg
620004075	Minebase Tablets 50 for Pediatric 50mg
620004076	Minebase Tablets 200 200mg
620004476	Klaricid Dry Syrup 10% for Pediatric 100mg
620004974	Clarith Dry Syrup 10% for Pediatric 100mg
620005425	Clarithromycin Tablets 50 for Pediatric (MEEK) 50mg
620005426	Clarithromycin Dry Syrup 10% for Pediatric (TAIYO) 100mg
620005427	Claroycin Dry Syrup 10% for Pediatric 100mg

Supplementary Table 1 (continued)

Drug code	Drug name
620006669	Clarithromycin Tablets 50mg for Pediatric (MYLAN)
620006670	Clarithromycin Tablets 200mg (MYLAN)
620006671	Clarithromycin Dry Syrup 10% for Pediatric (MYLAN) 100mg
620008013	Clarithromycin Tablets 200mg (TANABE)
621741203	Clarithromycin Tablets 50mg for Pediatric (KYORIN)
621742103	Clarithromycin Tablets 200mg (KYORIN)
621752801	Clarithromycin Tablets for Pediatric 50mg (TOWA)
621752901	Clarithromycin Tablets 200mg (TOWA)
621753001	Clarithromycin DS for Pediatric 10% (TOWA) 100mg
622079301	Clarithromycin Tablets 50mg for Pediatric (NP)
622079401	Clarithromycin Tablets 200mg (NP)

Note: Brand name with company name is used as the drug name to identify drugs in the database.

Supplementary Table 2 List of disease name used for definition of comorbidities

1. Upper gastrointestinal disease			
Classification		Disease code	Disease name
GERD		8845215	postoperative refractory reflux esophagitis requiring maintenance therapy
		8843825	refractory reflux esophagitis requiring maintenance therapy
		5301002	reflux esophagitis
		8844239	postoperative reflux esophagitis
		8845322	postoperative intractable regurgitant esophagitis
		8838366	intractable regurgitant esophagitis
		8842668	gastroesophageal reflux disease
		8843104	non-erosive reflux disease
Barrett's esophagus		8844315	Barrett's esophagus
Others	Esophagitis (K20)	8830325	alkaline esophagitis
		8830863	necrotic esophagitis
		8831126	chemical esophagitis
		8831624	esophagitis infection
		8847750	eosinophilic esophagitis
		8834682	peptic esophagitis
		5301007	esophagitis
		5301016	esophageal abscess
		1509007	postoperative esophagitis
		8847810	desquamative esophagitis

Supplementary Table 2 (continued)

Classification		Disease code	Disease name
Others	Esophagitis (K20)	8842844	corrosive esophagitis
		8841638	radiation esophagitis
Other diseases of esophagus (K22)	Other diseases of esophagus (K22)	5300006	megaesophagus
		8842924	esophageal achalasia
		8834683	peptic esophageal ulcer
		5302002	esophageal ulcer
		5308011	esophageal erosion
		8834927	mycotic esophageal ulcer
		8839122	Barrett's ulcer
		8839814	cardia ulcer
		5302003	drug-induced esophagus ulcer
		8834846	compression of esophagus
		5303006	esophageal stenosis
		8834859	esophagus scar
		8834864	esophageal obstruction
		8834866	benign esophageal stenosis
		8842845	Caustic esophageal stenosis
		8839813	cardia stenosis
		5304001	esophageal perforation
		8838184	spontaneous esophageal rupture
		5305002	esophageal spasm
		8839541	diffuse esophageal spasm

Supplementary Table 2 (continued)

Classification		Disease code	Disease name
Others	Other	8840879	spiral staircase
	diseases of	8830660	pharyngoesophageal diverticulum
	esophagus	8833578	acquired esophageal diverticulum
	(K22)	8841234	Rokitansky's diverticulum
		8840294	Mallory-Weiss syndrome
		8834847	achalasia of esophagus
		5308006	esophageal achalasia
		5308005	esophageal hemorrhage
		5309003	esophagus mass
		5308007	esophageal passage disturbance
		8834854	esophagomalacia
		2390080	esophageal submucous mass
		8834857	esophageal cyst
		2110003	esophageal polyp
		5303005	esophageal fistula
		5309004	esophageal disorder
	Gastric ulcer	5350009	acute gastric mucosal lesion
	(K25)	5319011	acute hemorrhagic gastric ulcer
		8847768	postoperative gastric ulcer
		8847779	stress gastric ulcer
		8847799	Dieulafoy ulcer
		8832277	acute gastric ulcer perforation

Supplementary Table 2 (continued)

Classification		Disease code	Disease name
Others	Gastric ulcer (K25)	8845122	acute hemorrhagic gastric ulcer perforation
		5313001	acute gastric ulcer
		8834632	hemorrhagic gastric ulcer
		9620001	steroid ulcer
		8847788	multiple hemorrhagic gastric ulcer
		8830483	gastric perforation
		8835734	steroid ulcer perforation
		5310002	gastric ulcer perforation
		8847782	penetrating gastric ulcer
		8845130	hemorrhagic gastric ulcer perforation
		8830419	gastric ulcer scar
		8833960	recurrent gastric ulcer
		5317003	chronic gastric ulcer
		8847819	chronic gastric ulcer active stage
		8842157	NSAID gastric ulcer
		5319009	gastric ulcer
		5310001	stomach erosion
		8834146	residual stomach ulcer
		8847787	multiple gastric ulcer
		5317002	intractable gastric ulcer
		8847823	drug-induced gastric ulcer

Supplementary Table 2 (continued)

Classification		Disease code	Disease name
Others	Duodenal ulcer (K26)	8845123	acute hemorrhagic duodenal ulcer
		8847773	postoperative duodenal ulcer
		8847780	stress duodenal ulcer
		8845126	acute duodenal ulcer perforation
		8845124	acute hemorrhagic duodenal ulcer perforation
		8845125	acute duodenal ulcer
		8834641	hemorrhagic duodenal ulcer
		8835296	duodenal perforation
		5325003	perforative duodenal ulcer
		5329012	penetrating duodenal ulcer
		8845131	hemorrhagic duodenal ulcer perforation
		8847756	duodenal ulcer reactivated
		8835291	duodenal ulcer scar
		8845143	chronic duodenal ulcer
		8847820	chronic duodenal ulcer active stage
		8842158	NSAID duodenal ulcer
		5329002	duodenal ulcer
		8842506	duodenum postbulbar ulcer
		5329003	duodenal erosions
		8847789	multiple duodenal ulcer
		8847806	refractory duodenal ulcer

Supplementary Table 2 (continued)

Classification		Disease code	Disease name
Others	Peptic ulcer, site unspecified (K27)	8847744	Cushing's ulcer
		8847769	postoperative gastroduodenal ulcer
		8847778	stress ulcer
		8847734	gastroduodenal ulcer scar
		8844007	gastroduodenal ulcer
	Gastrojejunal ulcer (K28)	8847762	anastomotic ulcer hemorrhage
		8847781	anastomotic ulcer perforation
		8847817	anastomotic ulcer scar
		8847807	refractory anastomotic ulcer
		5340003	stomal ulcer
	Gastritis and duodenitis (K29)	8834631	hemorrhagic gastritis
		8830424	perigastrojejunitis
		8830438	perigastritis
		8830604	phlegmonous gastritis
		5350004	acute gastritis
		5350006	acute erosive gastritis
		8830332	alcoholic gastritis
		5354018	superficial gastritis
		5351002	atrophic gastritis
		8830441	atrophic metaplastic gastritis
		5351003	chronic gastritis
		8830383	allergic gastritis

Supplementary Table 2 (continued)

Classification			Disease code	Disease name
Others	Gastritis and duodenitis (K29)		8837629	toxic gastritis
			8845818	intestinal metaplasia
			8838377	granulomatous gastritis
			8839028	reactive lymphoid hyperplasia
			8839561	erosive gastritis
			8841341	Helicobacter pylori gastritis
			5354024	radiation gastritis
			5352001	Menetrier disease
			8830605	verrucous gastritis
			8830417	gastritis
			5354012	postoperative residual stomach gastritis
			5356002	duodenitis
			8835294	periduodenitis
			8835299	duodenal papillitis
			5329011	erosive duodenitis
			5356005	chronic duodenitis
			8830461	gastroduodenitis
	Functional dyspepsia (K30)	8847604	functional dyspepsia	

Supplementary Table 2 (continued)

Classification		Disease code	Disease name
Others	Other	5361002	acute dilatation of stomach
	diseases of	8832248	functional pyloric stenosis
	stomach and	8835364	postoperative pyloric stenosis
	duodenum	8835888	Adult hypertrophic pyloric stenosis
	(K31)	8840769	pyloric stenosis
		8840770	pyloric atresia
		8830476	Hourglass stricture and stenosis of stomach
		8842633	pylorospasm
		8830425	stomach diverticulosis
		5378017	duodenal bulb deformity
		7511004	duodenal stenosis
		5373003	duodenal obstruction
		8835458	superior mesenteric artery syndrome
		5372002	chronic duodenal ileus
		8830429	gastric colonic fistula
		8830464	gastroduodenal fistula
		8830614	gastric fistula
		5374003	duodenal fistula
		2111027	stomach hyperplastic polyp
		8844933	gastroduodenal polyp
		2111005	gastric antral polyp
		8830495	gastric body polyp

Supplementary Table 2 (continued)

Classification		Disease code	Disease name
Others	Other	8843827	fundic gland polyp
	diseases of	8841602	gastric polyp
	stomach and	2112002	duodenal polyp
	duodenum	2111016	cardiac polyp
	(K31)	2111017	pyloric polyp
		8830413	gastric congestion
		8830414	stomach hyperkinesia
		8830415	Achylia gastrica
		8830416	gastric hypersecretion
		5368008	gastric dilatation
		8830420	gastroptosis
		8830423	gastric hyperfunction
		5378003	gastrostenosis
		5368018	stomach cramps
		2390012	gastric mass
		8830460	volvulus of stomach
		8830462	incarceration of gastro duodenum
		8830482	adhesion after gastric resection
		8845633	gastric antral vascular ectasia
		8830504	gastrointestinal dysfunction
		8844662	gastrointestinal weakness
		5379001	spontaneous rupture of the stomach

Supplementary Table 2 (continued)

Classification		Disease code	Disease name
Others	Other	8830592	gastric mucosa hyperplasia
	diseases of	8830593	gastric cyst
	stomach and	8830603	gastromalacia
	duodenum	8831204	hyperacidity
	(K31)	8832930	spastic gastritis
		2390064	duodenal mass
		5379003	duodenum rupture
		8837875	hypoacidity
		8839096	cascade stomach
		8840480	achlorhydria
		8840712	drug-induced stomach disease
		5368004	gastric dysfunction
		8830510	gastrointestinal function abnormal
		8830511	gastrointestinal hypofunction
		2111021	gastric submucosal mass
		5368021	functional vomiting
		8832278	acute gastrointestinal disturbance
	Other	5780005	hematemesis
	diseases of	5789005	bloody stool
	digestive	5781001	melena
	system	7921002	mucous and bloody stool
	(K92)	5789001	gastric bleeding

Supplementary Table 2 (continued)

Classification		Disease code	Disease name
Others	Other	5781002	lower gastrointestinal hemorrhage
	diseases of	5789007	gastrointestinal bleeding
	digestive	8848141	small intestinal bleeding
	system	5789008	upper gastrointestinal hemorrhage
	(K92)	8837732	intestinal hemorrhage
		5780004	hematemesis and melena
		5609015	digestive tract stenosis
		8834676	gastrointestinal polyp
		8830512	gastrointestinal disease
		8838493	Infant gastrointestinal disorders
2. IBD			
Classification		Disease code	Disease name
Crohn's disease (K50)		8831033	Crohn's ileitis
		8832789	jejunal Crohn's disease
		5550004	Crohn's enteritis
		5550006	duodenal Crohn's disease
		5551003	Crohn's colitis
		8846188	appendicitis Crohn's disease
		8837780	Crohn's disease of the rectum
		8846094	stomach Crohn's disease
		8846096	stomach duodenal Crohn's disease
		8846128	Crohn's disease of the anus

Supplementary Table 2 (continued)

Classification	Disease code	Disease name
Crohn's disease (K50)	8843906	Crohn's ileocolitis
	5559001	Crohn's disease
	8832850	juvenile arthritis associated with Crohn's disease
	8844993	steroid-dependent Crohn's disease
Ulcerative colitis (K51)	8845755	ulcerative colitis-pancolitis type
	8845772	acute ulcerative colitis
	8845782	fulminant ulcerative colitis
	8845798	severe ulcerative colitis
	8845757	ulcerative colitis-proctitis type
	8845756	ulcerative colitis-rectosigmoiditis type
	8845754	ulcerative colitis-left sided type
	91015	acute ulcerative colitis
	5569003	ulcerative colitis
	8845759	ulcerative colitis exacerbation
	8831064	juvenile arthritis in ulcerative colitis
	8845766	active stage ulcerative colitis
	8845767	remission ulcerative colitis
	8845779	mild ulcerative colitis
	8845785	relapse and remission ulcerative colitis
	8845793	first paroxysmal ulcerative colitis
	8844992	steroid-dependent ulcerative colitis
	8845810	steroid-resistant ulcerative colitis

Supplementary Table 2 (continued)

Classification	Disease code	Disease name	
Ulcerative colitis	8845816	moderate ulcerative colitis	
(K51)	8845833	chronic persistent ulcerative colitis	
3. Allergy			
Classification	Disease code	Disease name	
Allergy	8841313	allergic	bronchopulmonary candidiasis
	8841312	allergic	bronchopulmonary aspergillosis
	8841314	allergic broncho-pulmonarymycosis	
	8830390	allergic angiitis	
	8830393	allergic eosinophilia	
	8830388	allergic blepharitis	
	8830389	allergic marginal blepharitis	
	3721002	allergic conjunctivitis	
	8847603	seasonal allergic conjunctivitis	
	8847665	perennial allergic conjunctivitis	
	8830385	allergic keratitis	
	8830399	allergic uveitis	
	8830387	allergic external ear inflammation	
	8830169	subacute allergic otitis media	
	8832276	Acute allergic otitis otitis	
	8840300	chronic allergic otitis media	
	8830396	allergic otitis media	
	8845847	allergic rhinoconjunctivitis	

Supplementary Table 2 (continued)

Classification	Disease code	Disease name
Allergy	4779016	seasonal allergic rhinitis
	8837835	perennial allergic rhinitis
	8830398	allergic nasopharyngitis
	4779004	allergic rhinitis
	4779015	allergic sinusitis
	4640012	allergic laryngitis
	4939003	allergic bronchitis
	8830397	allergic pneumonia
	5280003	allergic stomatitis
	8844048	oral allergy syndrome
	8830383	allergic gastritis
	8830384	allergic gastroenteritis
	8830392	allergic diarrhea
	8830386	allergic hepatitis
	8845777	allergic contact dermatitis to gold
	8848495	allergic contact dermatitis to metals
	8848576	allergic contact dermatitis to adhesive
	8848502	allergic contact dermatitis to cosmetics
	8848458	allergic contact dermatitis to drugs
	8848591	allergic contact dermatitis to dye
	8848474	allergic contact dermatitis to chemicals
	8848526	allergic contact dermatitis to rubber

Supplementary Table 2 (continued)

Classification	Disease code	Disease name
Allergy	8848530	allergic contact dermatitis to insecticide
	8848577	allergic contact dermatitis to cement
	8848641	allergic contact dermatitis to nylon
	8848667	allergic contact dermatitis to plastic
	8845746	allergic contact dermatitis to rhus
	8845778	allergic contact dermatitis to ginkgo
	8845786	allergic contact dermatitis to primula
	8848549	allergic contact dermatitis to plants
	8830395	allergic contact dermatitis
	6918008	facial allergic dermatitis
	6929365	eczematous allergic contact dermatitis
	6929214	systemic allergic dermatitis
	6918003	allergic dermatitis
	8841311	allergic urticaria
	8840715	drug photoallergic response
	7162001	allergic arthritis
	8830400	allergic cystitis
	8847837	allergic cough
	8830391	allergic hematuria
	8848706	antiallergic drug poisoning
	9895014	insect bite allergy
	6931002	milk allergy

Supplementary Table 2 (continued)

Classification	Disease code	Disease name
Allergy	8842725	wheat allergy
	9953021	food allergy
	8842794	buckwheat allergy
	8842800	egg allergy
	8845482	peanut allergy
	8830382	allergy
	7823037	allergic edema
	9953011	pharyngeal allergy
	8842235	metal allergy
	8848611	mite allergy
	8844623	Latex allergy
	9958001	penicillin allergy
Pollen	8848025	poaceous pollinosis
	4770002	pollinosis
	8848033	orchard grass pollinosis
	8848069	Japanese cedar pollinosis
	8848097	Japanese cypress pollinosis
	8848099	ragweed pollinosis
Asthma	4930001	atopic asthma
	4930002	extrinsic asthma
	4930005	childhood asthma
	8834797	pediatric asthmatic bronchitis

Supplementary Table 2 (continued)

Classification	Disease code	Disease name
Asthma	4930006	occupational asthma
	8847408	asthma in infants
Hypersensitivity	9953017	photosensitivity
	6929389	cutaneous hypersensitivity
	9952037	drug hypersensitivity
	8843794	iodine hypersensitivity
Atopic	8847836	atopic cough

Supplementary Table 3 Drugs for gastroesophageal reflux disease treatment

Classification	Drug
histamine H ₂ receptor antagonist	Cimetidine
	Ranitidine hydrochloride
	Famotidine
	Nizatidine
	Roxatidine acetate hydrochloride
	Lafutidine
Potassium-competitive acid blocker	Vonoprazan fumarate
Proton pump inhibitors	Omeprazole
	Lansoprazole
	Rabeprazole sodium
	Esomeprazole Magnesium Hydrate
Others	L-Glutamine
	Irsogladine Maleate
	Ecabet Sodium
	Egualen sodium hydrate
	Gefarnate
	Sucralfate hydrate
	Sulpiride
	Cetraxate hydrochloride
	Sofalcone
	Teprenone
	Troxipide
	Pirenzepine hydrochloride hydrate
	Benexate hydrochloride betadex

Supplementary Table 3 (continued)

Classification	Drug (generic name)
Others	Polaprezinc
	Misoprostol
	Methylmethionine sulfonium chloride
	Rebamipide

Supplementary Table 4 Previous research on the relationship between *Helicobacter pylori* eradication and body mass index or metabolic syndrome

Author	Year	Journal	Study design	Sample size	Improvement	Exacerbation	Not associated	Follow-up
Azuma T ^[1]	2002	Aliment Pharmacol Ther	Intervention, observation study on healthy cohort	932		BW, BMI	TC	1 year
Elizalde JI et al. ^[2]	2002	Aliment Pharmacol Ther	Intervention, observation study on patient cohort	686	HDL-C	TG, TC		3 months
Fujiwara Y et al. ^[3]	2002	Hepato-gastroenterology	Intervention, observation study on peptic ulcer cohort	98		BMI, hyperlipidemia		Mean 4.91 years
Furuta T et al. ^[4]	2002	Aliment Pharmacol Ther	Intervention, patient cohort	579	-	TC, BW, BMI	BP, FBS, TG	1 year
Kamada T et al. ^[5]	2005	Dig Liver Dis	Case-control study	100		BMI, TG, TC		
Osawa H et al. ^[6]	2006	J Gastroenterol	Intervention, observation study on healthy cohort	134			BMI, TC, TG	12 weeks

Supplementary Table 4 (continued)

Author	Year	Journal	Study design	Sample size	Improvement	Exacerbation	Not associated	Follow-up
Jang EJ et al. [7]	2008	J Gastroenterol Hepatol	Intervention, peptic ulcer cohort	22			BMI	Not specified (less than 1 year)
Suto H et al. [8]	2009	Digestion	Intervention, observation study on dyspeptic patient cohort	163		BMI		1 and 5 years
Gen R et al. [9]	2010	South Med J	Intervention, observation study on patient cohort	159	HOMA-IR, TC, TG, LDL-C, HDL-C	-	-	
Lane JA et al. [10]	2011	Aliment Pharmacol Ther	RCT	1558	-	BMI, BW	-	

Supplementary Table 4 (continued)

Author	Year	Journal	Study design	Sample size	Improvement	Exacerbation	Not associated	Follow-up
Francois F et al. [11]	2011	BMC Gastroenterol	Intervention, observation study on patient cohort	92	-	BMI	-	
Nam SY et al. [12]	2015	Helicobacter	Intervention, observation study on healthy cohort	4269	LDL-C, HDL-C	BMI, TG		1~3 years
Dogan Z et al. [13]	2015	Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub	Intervention, observation study on healthy cohort	370	FBS, fasting insulin, HbA1c, HOMA-IR	-	-	6 months
Kachuei A et al. [14]	2016	J Research in Medical Sciences	RCT, prediabetic cohort	49	BP (systolic)	HOMA-IR		6 weeks

Supplementary Table 4 (continued)

Author	Year	Journal	Study design	Sample size	Improvement	Exacerbation	Not associated	Follow-up
Yanagi H et al. [15]	2017	BMJ Open Gastroenterology	Intervention, observation study on patient cohort	20			BW#, BMI#, TG#, BS, HbA1c#, HOMA-IR# #no significant difference, but numerically aggravated	3 months
Mokhtare M et al. [16]	2017	Diabetes Metab Syndr	Intervention, observation study on dyspeptic patient cohort	91	FBS, HbA1c, TC, LDL-C, HDL-C, waist	-	BW, BP, TG	

Supplementary Table 4 (continued)

Author	Year	Journal	Study design	Sample size	Improvement	Exacerbation	Not associated	Follow-up
Adachi K et al. [17]	2018	J Clin Biochem Nutr	Intervention, observation study on healthy cohort	774	LDL-C, HDL-C, TG, BMI	-	-	
Martín-Núñez GM et al. [18]	2019	PLOS ONE	Case-control study	case 40 control 20	HbA1c, HDL-C		BMI, waist, FBS, HOMA-IR, LDL-C, TG, Cholesterol, BP	2 months
Iwai N et al. [19]	2019	PLOS ONE	Intervention, observation study on patient cohort	163	HDL-C	BW, BMI	LDL-C, TC, TG, FBS, waist	mean 514.7 days
Kato M et al. [20]	2019	J Diabetes Invest	Cross-sectional study	21634	-	-	DM	

Supplementary Table 4 (continued)

Author	Year	Journal	Study design	Sample size	Improvement	Exacerbation	Not associated	Follow-up
Liou JM et al. [21]	2019	Lancet Infect Dis	RCT	1620	IR, TG, LCL-C, HDL-C	BW, BMI	-	
Mazzoleni F et al. [22]	2020	Int J Obesity	RCT on dyspeptic patients	case 201, control 203			BW, BMI, waist	1 year
Park Y et al. [23]	2021	Helicobacter	Intervention, observation study on healthy cohort	2626	dyslipidemia	-	-	
Ando T et al. [24]	2013	Helicobacter	Cohort	456	MS	-	-	

BMI, body mass index; BP, blood pressure; BW, body weight; DM, diabetes mellitus; FBS, fasting blood sugar; HbA1c, hemoglobin A1c; HDL-C, high-density lipoprotein cholesterol; HOMA-IR, homeostasis model assessment-estimated insulin resistance; IR, insulin resistance; LDL-C, low-density lipoprotein cholesterol; MS, metabolic syndrome; RCT, randomized controlled trial; TC, total cholesterol; TG, triglyceride.

Supplementary Figure 1 Percentage of patients with gastroesophageal reflux disease who received each indicated medication among those with or without *Helicobacter pylori* eradication therapy according to year from first diagnosis of gastroesophageal reflux disease (A) and by calendar year (B). In (A), year 0 represents the year of first GERD diagnosis. The shade of the cells represents the percentage of patients who received each treatment from low (light) to high (dark) by the patient group. ‘Others’ indicates other GERD treatments. GERD, gastroesophageal reflux disease; H₂RA, histamine H₂ receptor antagonist; P-CAB, potassium-competitive acid blocker; PPI, proton pump inhibitor.

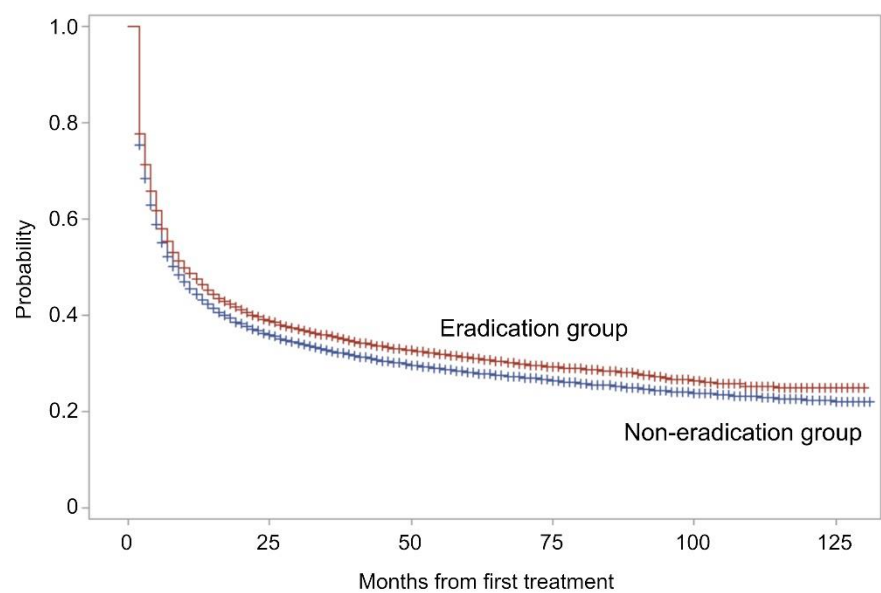
A

Year	Eradication group				Non-eradication group			
	% patients				% patients			
	PPI	H ₂ RA	P-CAB	Others	PPI	H ₂ RA	P-CAB	Others
0	69%	25%	18%	70%	66%	24%	16%	68%
1	30%	13%	7%	55%	27%	11%	6%	47%
2	29%	12%	7%	55%	26%	11%	6%	47%
3	30%	12%	7%	54%	26%	11%	6%	48%
4	31%	12%	7%	54%	28%	11%	6%	47%
5	33%	12%	7%	54%	30%	11%	6%	49%
6	34%	12%	7%	55%	32%	11%	7%	50%
7	35%	12%	8%	55%	33%	11%	8%	51%
8	35%	11%	9%	52%	32%	11%	8%	48%
9	35%	11%	9%	51%	32%	10%	8%	47%

B

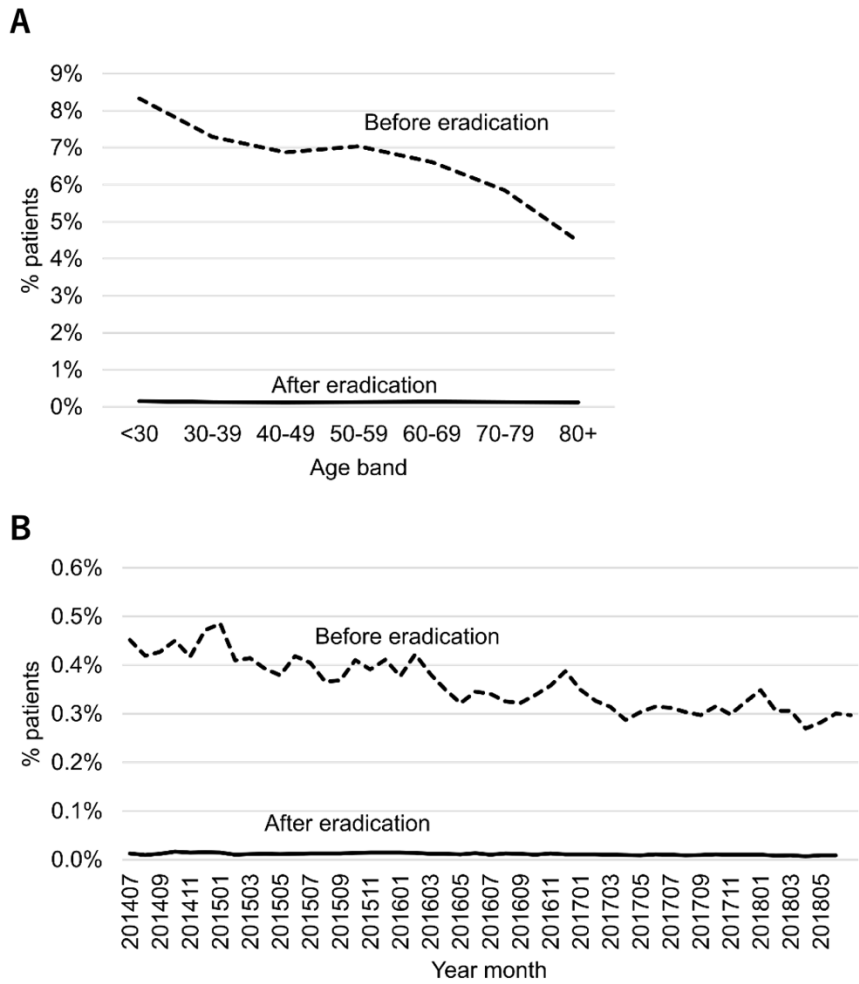
Year	Eradication group				Non-eradication group			
	% patients				% patients			
	PPI	H ₂ RA	P-CAB	Others	PPI	H ₂ RA	P-CAB	Others
2009	89%	22%	0%	44%	71%	18%	0%	50%
2010	73%	24%	0%	64%	64%	21%	0%	63%
2011	60%	19%	0%	66%	55%	19%	0%	61%
2012	53%	18%	0%	64%	51%	17%	0%	60%
2013	51%	18%	0%	63%	48%	17%	0%	58%
2014	52%	20%	0%	62%	49%	18%	0%	58%
2015	51%	20%	4%	61%	49%	18%	4%	57%
2016	44%	17%	7%	60%	41%	16%	7%	55%
2017	37%	15%	10%	58%	34%	13%	8%	51%
2018	33%	14%	11%	57%	31%	12%	9%	50%
2019	30%	12%	11%	56%	28%	11%	9%	49%
2020	19%	5%	6%	25%	17%	5%	5%	22%

Supplementary Figure 2 Continuous treatment period from first treatment for gastroesophageal reflux disease. DF: degree of freedom. Red: eradication group, blue: non-eradication group. + indicates censored.



Test of equality between groups			
Test	Chi-square	DF	P > Chi-square
Log-rank	969.94	1	< 0.01
Wilcoxon	1031.64	1	< 0.01
-2Log (LR)	1046.49	1	< 0.01

Supplementary Figure 3 Incidences of other upper gastrointestinal diseases in the 3-year periods before the year of eradication and after the year of eradication by age categories (A) and by months (B).



Supplementary Figure 4 Incidence of other upper gastrointestinal diseases by disease type presented according to year from eradication therapy. Year 0 is the year of primary eradication, and negative values represent years before primary eradication. The elapsed year from the eradication was calculated as the integer part of the difference of the time and the time of the eradication. If the difference is negative, the elapsed year was the integer part minus one, as in SAS, the integers of the negative numbers are upper-rounded. The shade of the cells represents the incidence of each disease from low (light) to high (dark).

Note: Esophagitis does not include gastroesophageal reflux disease and Barrett's esophagus. * indicates that the number of patients included in the cell was ≤ 10 .

Year	Denominator (patient year)	Esophagitis	Other diseases of esophagus	Gastric ulcer	Duodenal ulcer	Peptic ulcer, site unspecified
-10	1146497	0.02%	0.04%	2.98%	0.29%	0.04%
-9	1943505	0.02%	0.04%	3.09%	0.30%	0.04%
-8	2761765	0.03%	0.05%	3.15%	0.32%	0.04%
-7	3364755	0.03%	0.05%	3.19%	0.32%	0.05%
-6	4001760	0.03%	0.05%	3.14%	0.33%	0.05%
-5	4520587	0.03%	0.06%	3.14%	0.34%	0.05%
-4	4746859	0.03%	0.06%	3.06%	0.34%	0.06%
-3	4880888	0.03%	0.06%	2.96%	0.36%	0.07%
-2	5025747	0.03%	0.07%	3.08%	0.43%	0.08%
-1	4732998	0.08%	0.25%	13.04%	3.79%	0.45%
0	4892585	0.10%	0.29%	11.69%	3.82%	0.43%
1	4137930	0.05%	0.13%	1.70%	0.28%	0.09%
2	3344893	0.05%	0.13%	1.45%	0.24%	0.08%
3	2520763	0.04%	0.13%	1.26%	0.22%	0.08%
4	1900509	0.04%	0.13%	1.08%	0.20%	0.08%
5	1275881	0.05%	0.13%	0.88%	0.19%	0.08%

Supplementary Figure 4 (continued)

Year	Denominator (patient year)	Anastomotic ulcer	Gastritis and duodenitis	Functional dyspepsia	Other diseases of stomach and duodenum	Other diseases of digestive system
-10	1146497	0.00%	9.78%	*	0.43%	0.49%
-9	1943505	0.00%	9.68%	*	0.48%	0.54%
-8	2761765	0.00%	9.37%	*	0.53%	0.57%
-7	3364755	0.00%	8.96%	0.00%	0.57%	0.61%
-6	4001760	0.00%	8.54%	0.02%	0.62%	0.66%
-5	4520587	0.00%	8.14%	0.03%	0.67%	0.70%
-4	4746859	0.00%	7.28%	0.05%	0.68%	0.73%
-3	4880888	0.00%	6.44%	0.07%	0.69%	0.78%
-2	5025747	0.00%	6.04%	0.10%	0.72%	0.84%
-1	4732998	0.01%	18.25%	0.33%	2.46%	2.36%
0	4892585	0.01%	18.00%	0.69%	2.52%	1.85%
1	4137930	0.01%	1.32%	0.33%	0.75%	0.89%
2	3344893	0.01%	1.18%	0.30%	0.70%	0.86%
3	2520763	0.01%	1.16%	0.29%	0.67%	0.85%
4	1900509	0.01%	1.15%	0.30%	0.65%	0.85%
5	1275881	0.01%	1.21%	0.29%	0.63%	0.84%

Supplementary Figure 5 Prevalence of allergic diseases subclassified according to the type of allergy by year from eradication therapy. Year 0 is the year of primary eradication, and negative values represent years before primary eradication. The elapsed year from the eradication was calculated as the integer part of the difference of the time and the time of the eradication. If the difference is negative, the elapsed year was the integer part minus one, as in SAS, the integers of the negative numbers are upper-rounded. The shade of the cells represents the prevalence of each disease from low (light) to high (dark).

Note: * indicates that the number of patients included in the cell was ≤ 10 .

Year	Denominator (patient year)	Type of allergy				
		Allergy	Pollen	Asthma	Hypersensitivity	Atopic
-10	1146497	17.0%	0.88%	0.008%	0.03%	*
-9	1943505	19.4%	1.07%	0.009%	0.03%	*
-8	2761765	20.7%	1.12%	0.013%	0.03%	*
-7	3364755	22.6%	1.22%	0.015%	0.04%	*
-6	4001760	23.8%	1.25%	0.015%	0.04%	0.000%
-5	4520587	25.1%	1.27%	0.018%	0.04%	0.001%
-4	4746859	26.8%	1.32%	0.019%	0.04%	0.003%
-3	4880888	28.2%	1.33%	0.021%	0.05%	0.004%
-2	5025747	29.8%	1.35%	0.022%	0.05%	0.006%
-1	4732998	33.2%	1.47%	0.026%	0.06%	0.009%
0	4892585	34.2%	1.51%	0.027%	0.08%	0.011%
1	4137930	34.5%	1.49%	0.027%	0.07%	0.011%
2	3344893	35.2%	1.51%	0.028%	0.07%	0.012%
3	2520763	36.2%	1.55%	0.027%	0.07%	0.013%
4	1900509	36.0%	1.54%	0.028%	0.07%	0.013%
5	1275881	38.0%	1.62%	0.029%	0.08%	0.014%

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