

Gastrointestinal infections are underestimated but fatal in chimeric antigen receptor T-cell therapy: a real-world study leveraging FDA adverse event reporting system from 2017 to 2021

Supplementary materials:

Table S1. Detailed signal detection outcome for CAR-T associated gastrointestinal adverse events.

Drug	PTs	a	b	c	d	IC	IC ₀₂₅	IC ₉₇₅	ROR	ROR ₀₂₅	ROR ₉₇₅
CAR-T	Nausea	177	44753	319029	26270258	-1.60	-1.85	-1.35	0.33	0.28	0.38
CAR-T	Vomiting	133	44797	181747	26407540	-1.20	-1.49	-0.92	0.43	0.36	0.51
CAR-T	Diarrhoea	128	44802	289768	26299519	-1.93	-2.22	-1.64	0.26	0.22	0.31
CAR-T	Dysphagia	72	44858	36701	26552586	0.21	-0.18	0.61	1.16	0.92	1.46
CAR-T	Abdominal pain	62	44868	95253	26494034	-1.37	-1.79	-0.94	0.39	0.30	0.50
CAR-T	Gastrointestinal haemorrhage	45	44885	41891	26547396	-0.65	-1.15	-0.15	0.64	0.48	0.85
CAR-T	Clostridium difficile colitis	44	44886	4457	26584830	2.46	1.95	2.96	5.55	4.12	7.46
CAR-T	Gastrointestinal infection	35	44895	4164	26585123	2.23	1.66	2.79	4.71	3.38	6.57
CAR-T	Abdominal distension	30	44900	42348	26546939	-1.24	-1.85	-0.62	0.42	0.30	0.60
CAR-T	Incontinence	29	44901	4342	26584945	1.91	1.28	2.53	3.77	2.61	5.43
CAR-T	Stomatitis	28	44902	28058	26561229	-0.75	-1.39	-0.11	0.59	0.41	0.86
CAR-T	Ascites	23	44907	11986	26577301	0.18	-0.53	0.89	1.13	0.75	1.70
CAR-T	Constipation	23	44907	94835	26494452	-2.77	-3.48	-2.07	0.15	0.10	0.22
CAR-T	Enterovirus infection	23	44907	399	26588888	4.28	3.57	4.98	20.02	13.15	30.48
CAR-T	Hypophagia	21	44909	10507	26578780	0.24	-0.51	0.98	1.18	0.77	1.81
CAR-T	Gastrointestinal toxicity	19	44911	1828	26587459	2.43	1.65	3.21	5.44	3.46	8.54

CAR-T	Mouth haemorrhage	19	44911	2993	26586294	1.80	1.02	2.59	3.51	2.24	5.51
CAR-T	Oral pain	19	44911	9659	26579628	0.21	-0.57	0.99	1.16	0.74	1.82
CAR-T	Pancreatitis	19	44911	16433	26572854	-0.53	-1.32	0.25	0.69	0.44	1.08
CAR-T	Colitis	18	44912	17096	26572191	-0.67	-1.47	0.14	0.63	0.40	1.00
CAR-T	Mucormycosis	15	44915	1491	26587796	2.35	1.46	3.24	5.13	3.09	8.54
CAR-T	Abdominal discomfort	14	44916	79350	26509937	-3.21	-4.13	-2.29	0.11	0.06	0.18
CAR-T	Gastrointestinal bacterial infection	14	44916	561	26588726	3.30	2.38	4.22	10.02	5.89	17.02
CAR-T	Gastrointestinal disorder	14	44916	35021	26554266	-2.04	-2.96	-1.12	0.24	0.14	0.41
CAR-T	Abdominal compartment syndrome	13	44917	221	26589066	3.92	2.96	4.87	15.46	8.83	27.05
CAR-T	Dysgeusia	13	44917	23942	26565345	-1.60	-2.56	-0.64	0.33	0.19	0.57
CAR-T	Intestinal perforation	13	44917	4588	26584699	0.71	-0.25	1.67	1.64	0.95	2.82
CAR-T	Abdominal pain upper	12	44918	85030	26504257	-3.53	-4.53	-2.52	0.09	0.05	0.15
CAR-T	Abdominal mass	10	44920	1096	26588191	2.15	1.04	3.26	4.46	2.40	8.32
CAR-T	Oropharyngeal pain	10	44920	43099	26546188	-2.80	-3.91	-1.70	0.14	0.08	0.27
CAR-T	Gastroenteritis	8	44922	7066	26582221	-0.55	-1.80	0.71	0.68	0.34	1.37
CAR-T	Upper gastrointestinal haemorrhage	8	44922	8762	26580525	-0.85	-2.10	0.41	0.56	0.28	1.11
CAR-T	Haematochezia	7	44923	25047	26564240	-2.51	-3.87	-1.16	0.17	0.08	0.37
CAR-T	Lip swelling	7	44923	11908	26577379	-1.46	-2.81	-0.10	0.36	0.17	0.76
CAR-T	Pancreatic enlargement	7	44923	130	26589157	3.36	2.00	4.71	10.42	4.87	22.30
CAR-T	Retching	7	44923	7966	26581321	-0.90	-2.25	0.46	0.54	0.26	1.13
CAR-T	Retroperitoneal haemorrhage	7	44923	916	26588371	1.87	0.51	3.22	3.66	1.74	7.71
CAR-T	Abnormal faeces	6	44924	4132	26585155	-0.20	-1.69	1.28	0.87	0.39	1.93
CAR-T	Anal incontinence	6	44924	5519	26583768	-0.60	-2.08	0.89	0.66	0.30	1.47
CAR-T	Enterocolitis	6	44924	2755	26586532	0.33	-1.15	1.82	1.26	0.57	2.81
CAR-T	Gastrointestinal oedema	6	44924	813	26588474	1.79	0.31	3.27	3.47	1.55	7.75

CAR-T	Gastrooesophageal reflux disease	6	44924	34185	26555102	-3.16	-4.65	-1.68	0.11	0.05	0.25
CAR-T	Ileus	6	44924	4586	26584701	-0.34	-1.83	1.14	0.79	0.35	1.75
CAR-T	Intestinal ischaemia	6	44924	2114	26587173	0.67	-0.81	2.16	1.60	0.72	3.56
CAR-T	Melaena	6	44924	9247	26580040	-1.31	-2.79	0.17	0.40	0.18	0.90
CAR-T	Odynophagia	6	44924	2271	26587016	0.58	-0.90	2.07	1.50	0.67	3.34
CAR-T	Pelvic pain	6	44924	5416	26583871	-0.57	-2.05	0.91	0.67	0.30	1.50
CAR-T	Taste disorder	6	44924	8790	26580497	-1.24	-2.72	0.24	0.42	0.19	0.94
CAR-T	Bruxism	5	44925	2102	26587185	0.44	-1.21	2.09	1.36	0.56	3.26
CAR-T	Dyspepsia	5	44925	38024	26551263	-3.56	-5.21	-1.90	0.08	0.04	0.20
CAR-T	Gastric haemorrhage	5	44925	4546	26584741	-0.57	-2.23	1.08	0.67	0.28	1.62
CAR-T	Gastroenteritis salmonella	5	44925	366	26588921	2.29	0.63	3.94	4.92	2.03	11.89
CAR-T	Gastroenteritis viral	5	44925	8227	26581060	-1.39	-3.04	0.27	0.38	0.16	0.92
CAR-T	Gastrointestinal perforation	5	44925	1704	26587583	0.70	-0.95	2.36	1.63	0.68	3.92
CAR-T	Gastrointestinal viral infection	5	44925	443	26588844	2.13	0.48	3.79	4.41	1.82	10.64
CAR-T	Pancreatitis acute	5	44925	7985	26581302	-1.35	-3.00	0.31	0.39	0.16	0.94
CAR-T	Proctalgia	5	44925	2593	26586694	0.17	-1.48	1.83	1.13	0.47	2.71
CAR-T	Retroperitoneal haematoma	5	44925	845	26588442	1.51	-0.15	3.16	2.85	1.18	6.87
CAR-T	Small intestinal obstruction	5	44925	5441	26583846	-0.82	-2.47	0.84	0.57	0.24	1.36
CAR-T	Abdominal lymphadenopathy	4	44926	506	26588781	1.73	-0.17	3.63	3.32	1.24	8.88
CAR-T	Abdominal tenderness	4	44926	1908	26587379	0.27	-1.63	2.17	1.21	0.45	3.22
CAR-T	Anal abscess	4	44926	2892	26586395	-0.26	-2.16	1.64	0.84	0.31	2.23
CAR-T	Cryptosporidiosis infection	4	44926	222	26589065	2.35	0.45	4.25	5.14	1.91	13.82
CAR-T	Duodenal ulcer	4	44926	2657	26586630	-0.15	-2.05	1.75	0.90	0.34	2.40
CAR-T	Enteritis	4	44926	3140	26586147	-0.37	-2.27	1.53	0.78	0.29	2.07
CAR-T	Gastroenteritis adenovirus	4	44926	77	26589210	2.82	0.92	4.72	7.14	2.61	19.51

CAR-T	Graft versus host disease in gastrointestinal tract	4	44926	1334	26587953	0.71	-1.19	2.61	1.63	0.61	4.36
CAR-T	Haematemesis	4	44926	9706	26579581	-1.91	-3.81	-0.01	0.27	0.10	0.71
CAR-T	Lip infection	4	44926	124	26589163	2.65	0.75	4.55	6.34	2.34	17.17
CAR-T	Neutropenic colitis	4	44926	832	26588455	1.24	-0.66	3.14	2.36	0.88	6.31
CAR-T	Oral disorder	4	44926	3044	26586243	-0.33	-2.23	1.57	0.80	0.30	2.13
CAR-T	Oral herpes	4	44926	9378	26579909	-1.86	-3.76	0.04	0.28	0.10	0.73
CAR-T	Pharyngitis	4	44926	6718	26582569	-1.40	-3.30	0.50	0.38	0.14	1.01
CAR-T	Tongue ulceration	4	44926	1343	26587944	0.70	-1.20	2.60	1.62	0.61	4.34
CAR-T	Abdominal infection	3	44927	1129	26588158	0.54	-1.75	2.83	1.45	0.47	4.51
CAR-T	Acute abdomen	3	44927	542	26588745	1.30	-0.99	3.59	2.47	0.79	7.69
CAR-T	Clostridium colitis	3	44927	208	26589079	2.03	-0.26	4.32	4.11	1.31	12.85
CAR-T	Flatulence	3	44927	22905	26566382	-3.48	-5.77	-1.19	0.09	0.03	0.28
CAR-T	Gastric disorder	3	44927	20332	26568955	-3.31	-5.60	-1.02	0.10	0.03	0.31
CAR-T	Gastroenteritis norovirus	3	44927	882	26588405	0.81	-1.48	3.10	1.76	0.57	5.46
CAR-T	Gastrointestinal ulcer	3	44927	890	26588397	0.80	-1.49	3.09	1.75	0.56	5.43
CAR-T	Haemoperitoneum	3	44927	328	26588959	1.73	-0.56	4.02	3.32	1.07	10.35
CAR-T	Hiccups	3	44927	2893	26586394	-0.62	-2.91	1.67	0.65	0.21	2.02
CAR-T	Lip disorder	3	44927	752	26588535	0.98	-1.31	3.27	1.98	0.64	6.14
CAR-T	Peritonitis	3	44927	5717	26583570	-1.54	-3.83	0.75	0.34	0.11	1.07
CAR-T	Pneumatosis intestinalis	3	44927	1237	26588050	0.43	-1.86	2.72	1.35	0.44	4.20
CAR-T	Pneumoperitoneum	3	44927	688	26588599	1.07	-1.22	3.36	2.11	0.68	6.54
CAR-T	Retroperitoneal fibrosis	3	44927	201	26589086	2.05	-0.24	4.34	4.17	1.33	13.03
CAR-T	Sialoadenitis	3	44927	643	26588644	1.14	-1.15	3.43	2.21	0.71	6.86
CAR-T	Small intestinal perforation	3	44927	743	26588544	0.99	-1.30	3.28	1.99	0.64	6.20
CAR-T	Swollen tongue	3	44927	10643	26578644	-2.40	-4.69	-0.11	0.19	0.06	0.59

CAR-T	Toothache	3	44927	7424	26581863	-1.90	-4.19	0.39	0.27	0.09	0.83
Axi-cel	Nausea	75	13841	319131	26301170	-1.15	-1.53	-0.76	0.45	0.36	0.56
Axi-cel	Diarrhoea	56	13860	289840	26330461	-1.43	-1.87	-0.98	0.37	0.28	0.48
Axi-cel	Vomiting	48	13868	181832	26438469	-0.98	-1.46	-0.50	0.51	0.38	0.67
Axi-cel	Dysphagia	35	13881	36738	26583563	0.85	0.28	1.42	1.80	1.29	2.51
Axi-cel	Abdominal pain	34	13882	95281	26525020	-0.54	-1.12	0.03	0.68	0.49	0.96
Axi-cel	Gastrointestinal haemorrhage	21	13895	41915	26578386	-0.06	-0.80	0.68	0.96	0.63	1.47
Axi-cel	Incontinence	21	13895	4350	26615951	2.95	2.21	3.69	7.76	5.05	11.92
Axi-cel	Clostridium difficile colitis	20	13896	4481	26615820	2.85	2.09	3.61	7.22	4.65	11.20
Axi-cel	Constipation	10	13906	94848	26525453	-2.25	-3.36	-1.15	0.21	0.11	0.39
Axi-cel	Hypophagia	10	13906	10518	26609783	0.81	-0.30	1.91	1.75	0.94	3.26
Axi-cel	Colitis	9	13907	17105	26603196	0.01	-1.17	1.18	1.01	0.52	1.93
Axi-cel	Abdominal pain upper	8	13908	85034	26535267	-2.40	-3.66	-1.15	0.19	0.09	0.38
Axi-cel	Dysgeusia	8	13908	23947	26596354	-0.61	-1.87	0.64	0.65	0.33	1.31
Axi-cel	Intestinal perforation	8	13908	4593	26615708	1.55	0.29	2.80	2.93	1.46	5.87
Axi-cel	Ascites	7	13909	12002	26608299	0.15	-1.21	1.50	1.11	0.53	2.32
Axi-cel	Pelvic pain	6	13910	5416	26614885	0.96	-0.52	2.45	1.95	0.88	4.35
Axi-cel	Retroperitoneal haemorrhage	6	13910	917	26619384	2.73	1.24	4.21	6.64	2.97	14.82
Axi-cel	Dyspepsia	5	13911	38024	26582277	-1.89	-3.54	-0.23	0.27	0.11	0.65
Axi-cel	Gastrointestinal perforation	5	13911	1704	26618597	1.98	0.33	3.64	3.96	1.64	9.52
Axi-cel	Gastrooesophageal reflux disease	5	13911	34186	26586115	-1.74	-3.39	-0.08	0.30	0.12	0.72
Axi-cel	Intestinal ischaemia	5	13911	2115	26618186	1.77	0.12	3.43	3.43	1.42	8.24
Axi-cel	Abnormal faeces	4	13912	4134	26616167	0.76	-1.14	2.66	1.69	0.63	4.51
Axi-cel	Duodenal ulcer	4	13912	2657	26617644	1.25	-0.65	3.15	2.38	0.89	6.35
Axi-cel	Enterocolitis	4	13912	2757	26617544	1.21	-0.69	3.11	2.32	0.87	6.18
Axi-cel	Gastrointestinal disorder	4	13912	35031	26585270	-2.06	-3.96	-0.16	0.24	0.09	0.64

Axi-cel	Ileus	4	13912	4588	26615713	0.63	-1.27	2.53	1.55	0.58	4.14
Axi-cel	Mucormycosis	4	13912	1502	26618799	1.81	-0.09	3.71	3.50	1.31	9.34
Axi-cel	Oral herpes	4	13912	9378	26610923	-0.26	-2.16	1.64	0.83	0.31	2.22
Axi-cel	Tongue ulceration	4	13912	1343	26618958	1.90	0.00	3.80	3.74	1.40	9.99
Axi-cel	Clostridium colitis	3	13913	208	26620093	2.52	0.23	4.81	5.75	1.84	17.98
Axi-cel	Gastric disorder	3	13913	20332	26599969	-1.67	-3.96	0.62	0.31	0.10	0.97
Axi-cel	Lip disorder	3	13913	752	26619549	1.97	-0.32	4.26	3.92	1.26	12.18
Axi-cel	Odynophagia	3	13913	2274	26618027	1.05	-1.24	3.34	2.07	0.67	6.43
Axi-cel	Pancreatitis acute	3	13913	7987	26612314	-0.42	-2.71	1.87	0.75	0.24	2.32
Axi-cel	Pharyngitis	3	13913	6719	26613582	-0.20	-2.49	2.09	0.87	0.28	2.71
Axi-cel	Pneumoperitoneum	3	13913	688	26619613	2.02	-0.27	4.31	4.07	1.31	12.66
Axi-cel	Retroperitoneal haematoma	3	13913	847	26619454	1.89	-0.40	4.18	3.71	1.19	11.54
Axi-cel	Small intestinal perforation	3	13913	743	26619558	1.98	-0.31	4.27	3.94	1.27	12.25
Axi-cel	Stomatitis	3	13913	28083	26592218	-2.12	-4.41	0.17	0.23	0.07	0.71
Tisagenlecleucel	Nausea	96	29270	319110	26285741	-1.87	-2.21	-1.53	0.27	0.22	0.33
Tisagenlecleucel	Vomiting	79	29287	181801	26423050	-1.34	-1.71	-0.96	0.39	0.32	0.49
Tisagenlecleucel	Diarrhoea	64	29302	289832	26315019	-2.31	-2.73	-1.89	0.20	0.16	0.26
Tisagenlecleucel	Gastrointestinal infection	35	29331	4164	26600687	2.79	2.22	3.36	6.97	5.00	9.73
Tisagenlecleucel	Dysphagia	33	29333	36740	26568111	-0.29	-0.88	0.29	0.82	0.58	1.15
Tisagenlecleucel	Abdominal distension	29	29337	42349	26562502	-0.68	-1.30	-0.05	0.62	0.43	0.90
Tisagenlecleucel	Abdominal pain	28	29338	95287	26509564	-1.89	-2.53	-1.25	0.27	0.19	0.39
Tisagenlecleucel	Stomatitis	25	29341	28061	26576790	-0.30	-0.98	0.37	0.81	0.55	1.20
Tisagenlecleucel	Clostridium difficile colitis	23	29343	4478	26600373	2.10	1.40	2.81	4.32	2.87	6.51
Tisagenlecleucel	Enterovirus infection	23	29343	399	26604452	4.61	3.90	5.31	25.00	16.42	38.06
Tisagenlecleucel	Gastrointestinal haemorrhage	20	29346	41916	26562935	-1.19	-1.95	-0.43	0.44	0.28	0.68
Tisagenlecleucel	Gastrointestinal toxicity	19	29347	1828	26603023	2.94	2.16	3.72	7.75	4.93	12.18

Tisagenlecleucel	Mouth haemorrhage	19	29347	2993	26601858	2.35	1.57	3.13	5.13	3.27	8.05
Tisagenlecleucel	Oral pain	19	29347	9659	26595192	0.80	0.02	1.58	1.75	1.11	2.74
Tisagenlecleucel	Pancreatitis	17	29349	16435	26588416	-0.09	-0.92	0.74	0.94	0.58	1.51
Tisagenlecleucel	Ascites	16	29350	11993	26592858	0.26	-0.59	1.12	1.20	0.74	1.96
Tisagenlecleucel	Gastrointestinal bacterial infection	14	29352	561	26604290	3.68	2.76	4.60	12.96	7.62	22.03
Tisagenlecleucel	Abdominal compartment syndrome	13	29353	221	26604630	4.15	3.20	5.11	18.15	10.37	31.76
Tisagenlecleucel	Abdominal discomfort	12	29354	79352	26525499	-2.82	-3.82	-1.81	0.14	0.08	0.25
Tisagenlecleucel	Hypophagia	11	29355	10517	26594334	-0.07	-1.12	0.98	0.95	0.53	1.72
Tisagenlecleucel	Gastrointestinal disorder	10	29356	35025	26569826	-1.90	-3.00	-0.79	0.27	0.14	0.50
Tisagenlecleucel	Colitis	9	29357	17105	26587746	-1.03	-2.20	0.15	0.49	0.25	0.94
Tisagenlecleucel	Mucormycosis	9	29357	1497	26603354	2.14	0.96	3.31	4.41	2.29	8.50
Tisagenlecleucel	Oropharyngeal pain	9	29357	43100	26561751	-2.34	-3.51	-1.16	0.20	0.10	0.38
Tisagenlecleucel	Abdominal mass	8	29358	1098	26603753	2.31	1.05	3.56	4.97	2.48	9.96
Tisagenlecleucel	Gastroenteritis	8	29358	7066	26597785	0.03	-1.22	1.29	1.02	0.51	2.05
Tisagenlecleucel	Upper gastrointestinal haemorrhage	8	29358	8762	26596089	-0.26	-1.51	1.00	0.84	0.42	1.67
Tisagenlecleucel	Constipation	7	29359	94851	26510000	-3.81	-5.16	-2.45	0.07	0.03	0.15
Tisagenlecleucel	Lip swelling	7	29359	11908	26592943	-0.86	-2.22	0.49	0.55	0.26	1.15
Tisagenlecleucel	Pancreatic enlargement	7	29359	130	26604721	3.53	2.17	4.88	11.66	5.45	24.94
Tisagenlecleucel	Haematochezia	6	29360	25048	26579803	-2.11	-3.60	-0.63	0.23	0.10	0.51
Tisagenlecleucel	Retching	6	29360	7967	26596884	-0.52	-2.00	0.97	0.70	0.31	1.56
Tisagenlecleucel	Dysgeusia	5	29361	23950	26580901	-2.29	-3.95	-0.64	0.20	0.08	0.49
Tisagenlecleucel	Gastroenteritis viral	5	29361	8227	26596624	-0.80	-2.45	0.85	0.57	0.24	1.38
Tisagenlecleucel	Gastrointestinal oedema	5	29361	814	26604037	1.97	0.32	3.63	3.93	1.63	9.48
Tisagenlecleucel	Gastrointestinal viral infection	5	29361	443	26604408	2.47	0.81	4.12	5.56	2.30	13.43
Tisagenlecleucel	Incontinence	5	29361	4366	26600485	0.05	-1.61	1.70	1.03	0.43	2.49

Tisagenlecleucel	Taste disorder	5	29361	8791	26596060	-0.89	-2.55	0.76	0.54	0.22	1.30
Tisagenlecleucel	Abdominal lymphadenopathy	4	29362	506	26604345	2.08	0.18	3.98	4.25	1.59	11.37
Tisagenlecleucel	Abdominal pain upper	4	29362	85038	26519813	-4.39	-6.29	-2.49	0.05	0.02	0.13
Tisagenlecleucel	Abdominal tenderness	4	29362	1908	26602943	0.79	-1.11	2.69	1.73	0.65	4.61
Tisagenlecleucel	Anal abscess	4	29362	2892	26601959	0.29	-1.61	2.19	1.22	0.46	3.25
Tisagenlecleucel	Anal incontinence	4	29362	5521	26599330	-0.55	-2.45	1.35	0.68	0.26	1.82
Tisagenlecleucel	Bruxism	4	29362	2103	26602748	0.67	-1.23	2.57	1.60	0.60	4.25
Tisagenlecleucel	Gastroenteritis adenovirus	4	29362	77	26604774	2.93	1.03	4.83	7.69	2.82	21.02
Tisagenlecleucel	Gastroenteritis salmonella	4	29362	367	26604484	2.31	0.41	4.21	4.97	1.86	13.32
Tisagenlecleucel	Graft versus host disease in gastrointestinal tract	4	29362	1334	26603517	1.19	-0.71	3.09	2.28	0.85	6.09
Tisagenlecleucel	Intestinal perforation	4	29362	4597	26600254	-0.31	-2.21	1.59	0.81	0.30	2.15
Tisagenlecleucel	Lip infection	4	29362	124	26604727	2.81	0.91	4.71	7.07	2.61	19.13
Tisagenlecleucel	Melaena	4	29362	9249	26595602	-1.25	-3.15	0.65	0.42	0.16	1.12
Tisagenlecleucel	Neutropenic colitis	4	29362	832	26604019	1.66	-0.24	3.56	3.17	1.19	8.47
Tisagenlecleucel	Proctalgia	4	29362	2594	26602257	0.42	-1.48	2.32	1.34	0.50	3.57
Tisagenlecleucel	Cryptosporidiosis infection	3	29363	223	26604628	2.22	-0.07	4.51	4.69	1.50	14.66
Tisagenlecleucel	Flatulence	3	29363	22905	26581946	-2.88	-5.17	-0.59	0.14	0.04	0.42
Tisagenlecleucel	Gastrointestinal ulcer	3	29363	890	26603961	1.24	-1.05	3.53	2.36	0.76	7.34
Tisagenlecleucel	Haematemesis	3	29363	9707	26595144	-1.68	-3.97	0.61	0.31	0.10	0.97
Tisagenlecleucel	Oral disorder	3	29363	3045	26601806	-0.14	-2.43	2.15	0.91	0.29	2.81
Tisagenlecleucel	Retroperitoneal fibrosis	3	29363	201	26604650	2.27	-0.02	4.56	4.85	1.55	15.16
Tisagenlecleucel	Toothache	3	29363	7424	26597427	-1.31	-3.60	0.98	0.40	0.13	1.25
KTE-X19	Diarrhoea	7	1106	289889	26343215	-0.75	-2.11	0.61	0.59	0.28	1.24
KTE-X19	Vomiting	5	1108	181875	26451229	-0.56	-2.21	1.10	0.68	0.28	1.63
KTE-X19	Dysphagia	4	1109	36769	26596335	1.14	-0.76	3.04	2.21	0.83	5.91

KTE-X19	Nausea	4	1109	319202	26313902	-1.62	-3.52	0.28	0.32	0.12	0.86
KTE-X19	Gastrointestinal haemorrhage	3	1110	41933	26591171	0.64	-1.65	2.93	1.56	0.50	4.83
KTE-X19	Incontinence	3	1110	4368	26628736	2.36	0.07	4.65	5.13	1.65	15.94
Liso-cel	Constipation	5	475	94853	26538884	1.32	-0.34	2.97	2.50	1.04	6.04
Liso-cel	Gastric haemorrhage	4	476	4547	26629190	2.95	1.05	4.85	7.74	2.89	20.72

CAR-T, chimeric antigen receptor T-cell; axi-cel, axicabtagene-ciloleucel; liso-cel, lisocabtagene maraleucel; KTE-X19, brexucabtagene autoleucel; ROR, reporting odds ratios; IC, information component.

Table S2. Signal comparison between different CAR-T products in gastrointestinal adverse events.

CAR-T products	PTs	a	b	c	d	ROR	ROR ₀₂₅	ROR ₉₇₅	IC	IC ₀₂₅	IC ₉₇₅
axi-cel vs. tisagenlecleucel	Nausea	75	13841	96	29270	1.65	1.22	2.23	0.44	0.06	0.83
axi-cel vs. tisagenlecleucel	Vomiting	48	13868	79	29287	1.28	0.89	1.83	0.23	-0.25	0.71
axi-cel vs. tisagenlecleucel	Diarrhoea	56	13860	64	29302	1.84	1.28	2.63	0.53	0.09	0.98
axi-cel vs. tisagenlecleucel	Dysphagia	35	13881	33	29333	2.2	1.37	3.55	0.67	0.1	1.23
axi-cel vs. tisagenlecleucel	Abdominal pain	34	13882	28	29338	2.51	1.52	4.14	0.76	0.18	1.33
axi-cel vs. tisagenlecleucel	Gastrointestinal haemorrhage	21	13895	20	29346	2.16	1.17	3.98	0.65	-0.09	1.39
axi-cel vs. tisagenlecleucel	Clostridium difficile colitis	20	13896	23	29343	1.8	0.99	3.28	0.52	-0.24	1.28
axi-cel vs. tisagenlecleucel	Abdominal distension	1	13915	29	29337	0.11	0.01	0.77	-2.76	-8.06	2.54
axi-cel vs. tisagenlecleucel	Incontinence	21	13895	5	29361	7.5	2.83	19.9	1.28	0.54	2.02
axi-cel vs. tisagenlecleucel	Stomatitis	3	13913	25	29341	0.28	0.09	0.94	-1.44	-3.73	0.85
axi-cel vs. tisagenlecleucel	Ascites	7	13909	16	29350	0.93	0.38	2.26	-0.07	-1.43	1.28

axi-cel vs. tisagenlecleucel	Constipation	10	13906	7	29359	2.75	1.05	7.23	0.82	-0.29	1.92
axi-cel vs. tisagenlecleucel	Hypophagia	10	13906	11	29355	1.84	0.78	4.33	0.53	-0.57	1.64
axi-cel vs. tisagenlecleucel	Pancreatitis	2	13914	17	29349	0.29	0.07	1.26	-1.4	-4.44	1.64
axi-cel vs. tisagenlecleucel	Colitis	9	13907	9	29357	1.99	0.79	5.03	0.6	-0.58	1.77
axi-cel vs. tisagenlecleucel	Mucormycosis	4	13912	9	29357	0.94	0.29	3.07	-0.06	-1.96	1.84
axi-cel vs. tisagenlecleucel	Abdominal discomfort	2	13914	12	29354	0.4	0.09	1.81	-1	-4.04	2.04
axi-cel vs. tisagenlecleucel	Gastrointestinal disorder	4	13912	10	29356	0.86	0.27	2.74	-0.15	-2.05	1.75
axi-cel vs. tisagenlecleucel	Dysgeusia	8	13908	5	29361	2.96	0.97	9.06	0.86	-0.39	2.12
axi-cel vs. tisagenlecleucel	Intestinal perforation	8	13908	4	29362	3.55	1.07	11.79	0.96	-0.29	2.22
axi-cel vs. tisagenlecleucel	Abdominal pain upper	8	13908	4	29362	3.55	1.07	11.79	0.96	-0.29	2.22
axi-cel vs. tisagenlecleucel	Abdominal mass	2	13914	8	29358	0.58	0.12	2.74	-0.57	-3.61	2.47
axi-cel vs. tisagenlecleucel	Oropharyngeal pain	1	13915	9	29357	0.31	0.04	2.48	-1.31	-6.61	3.99
axi-cel vs. tisagenlecleucel	Haematochezia	1	13915	6	29360	0.45	0.05	3.73	-0.87	-6.17	4.43

axi-cel vs. tisagenlecleucel	Retching	1	13915	6	29360	0.45	0.05	3.73	-0.87	-6.17	4.43
axi-cel vs. tisagenlecleucel	Anal incontinence	2	13914	4	29362	1.04	0.19	5.7	0.04	-3	3.08
axi-cel vs. tisagenlecleucel	Enterocolitisagenlecle	4	13912	2	29364	3.11	0.57	16.97	0.89	-1.01	2.79
axi-cel vs. tisagenlecleucel	Gastrointestinal oedema	1	13915	5	29361	0.52	0.06	4.47	-0.7	-6	4.6
axi-cel vs. tisagenlecleucel	Gastrooesophageal reflux disease	5	13911	1	29365	5.65	0.66	48.35	1.18	-0.48	2.83
axi-cel vs. tisagenlecleucel	Ileus	4	13912	2	29364	3.11	0.57	16.97	0.89	-1.01	2.79
axi-cel vs. tisagenlecleucel	Intestinal ischaemia	5	13911	1	29365	5.65	0.66	48.35	1.18	-0.48	2.83
axi-cel vs. tisagenlecleucel	Melaena	2	13914	4	29362	1.04	0.19	5.7	0.04	-3	3.08
axi-cel vs. tisagenlecleucel	Odynophagia	3	13913	2	29364	2.42	0.4	14.47	0.73	-1.56	3.02
axi-cel vs. tisagenlecleucel	Taste disorder	1	13915	5	29361	0.52	0.06	4.47	-0.7	-6	4.6
axi-cel vs. tisagenlecleucel	Bruxism	1	13915	4	29362	0.63	0.07	5.6	-0.49	-5.79	4.81
axi-cel vs. tisagenlecleucel	Gastroenteritisagenlecle salmonella	1	13915	4	29362	0.63	0.07	5.6	-0.49	-5.79	4.81
axi-cel vs. tisagenlecleucel	Pancreatitisagenlecle acute	3	13913	2	29364	2.42	0.4	14.47	0.73	-1.56	3.02

axi-cel vs. tisagenlecleucel	Proctalgia	1	13915	4	29362	0.63	0.07	5.6	-0.49	-5.79	4.81
axi-cel vs. tisagenlecleucel	Small intestinal obstruction	2	13914	1	29365	2.57	0.23	28.32	0.77	-2.27	3.81
axi-cel vs. tisagenlecleucel	Cryptosporidiosis infection	1	13915	3	29363	0.78	0.08	7.5	-0.25	-5.55	5.05
axi-cel vs. tisagenlecleucel	Enteritisagenlecle	1	13915	1	29365	1.54	0.1	24.63	0.39	-4.91	5.69
axi-cel vs. tisagenlecleucel	Haematemesis	1	13915	3	29363	0.78	0.08	7.5	-0.25	-5.55	5.05
axi-cel vs. tisagenlecleucel	Oral disorder	1	13915	3	29363	0.78	0.08	7.5	-0.25	-5.55	5.05
axi-cel vs. tisagenlecleucel	Pharyngitisagenlecle	3	13913	1	29365	3.59	0.37	34.56	0.97	-1.32	3.26
axi-cel vs. tisagenlecleucel	Abdominal infection	1	13915	2	29364	1.04	0.09	11.43	0.03	-5.27	5.33
axi-cel vs. tisagenlecleucel	Acute abdomen	1	13915	2	29364	1.04	0.09	11.43	0.03	-5.27	5.33
axi-cel vs. tisagenlecleucel	Gastroenteritisagenlecle norovirus	1	13915	1	29365	1.54	0.1	24.63	0.39	-4.91	5.69
axi-cel vs. tisagenlecleucel	Hiccups	2	13914	1	29365	2.57	0.23	28.32	0.77	-2.27	3.81
axi-cel vs. tisagenlecleucel	Peritonitisagenlecle	2	13914	1	29365	2.57	0.23	28.32	0.77	-2.27	3.81
axi-cel vs. tisagenlecleucel	Pneumatosis intestinaliso-cel	1	13915	2	29364	1.04	0.09	11.43	0.03	-5.27	5.33

axi-cel vs. tisagenlecleucel	Sialoadenitisagenlecle	1	13915	2	29364	1.04	0.09	11.43	0.03	-5.27	5.33
axi-cel vs. tisagenlecleucel	Swollen tongue	1	13915	2	29364	1.04	0.09	11.43	0.03	-5.27	5.33
axi-cel vs. tisagenlecleucel	Colitisagenlecle ischaemic	1	13915	1	29365	1.54	0.1	24.63	0.39	-4.91	5.69
axi-cel vs. tisagenlecleucel	Cytomegalovirus colitisagenlecle	1	13915	1	29365	1.54	0.1	24.63	0.39	-4.91	5.69
axi-cel vs. tisagenlecleucel	Gastric fistula	1	13915	1	29365	1.54	0.1	24.63	0.39	-4.91	5.69
axi-cel vs. tisagenlecleucel	Gastric perforation	1	13915	1	29365	1.54	0.1	24.63	0.39	-4.91	5.69
axi-cel vs. tisagenlecleucel	Hypoaesthesia oral	1	13915	1	29365	1.54	0.1	24.63	0.39	-4.91	5.69
axi-cel vs. tisagenlecleucel	Intestinal obstruction	1	13915	1	29365	1.54	0.1	24.63	0.39	-4.91	5.69
axi-cel vs. tisagenlecleucel	Retroperitoneal lymphadenopathy	1	13915	1	29365	1.54	0.1	24.63	0.39	-4.91	5.69
KTE-X19 vs. tisagenlecleucel	Nausea	4	1109	96	29270	1.09	0.4	2.96	0.12	-1.78	2.02
KTE-X19 vs. tisagenlecleucel	Vomiting	5	1108	79	29287	1.58	0.64	3.9	0.62	-1.03	2.28
KTE-X19 vs. tisagenlecleucel	Diarrhoea	7	1106	64	29302	2.57	1.18	5.63	1.28	-0.08	2.63
KTE-X19 vs. tisagenlecleucel	Dysphagia	4	1109	33	29333	2.57	0.91	7.28	1.28	-0.62	3.18

KTE-X19 vs. tisagenlecleucel	Gastrointestinal haemorrhage	3	1110	20	29346	2.79	0.83	9.39	1.39	-0.9	3.68
KTE-X19 vs. tisagenlecleucel	Incontinence	3	1110	5	29361	5.08	1.21	21.28	2.14	-0.15	4.43
KTE-X19 vs. tisagenlecleucel	Constipation	1	1112	7	29359	1.96	0.24	15.95	0.92	-4.38	6.22
KTE-X19 vs. tisagenlecleucel	Odynophagia	1	1112	2	29364	2.61	0.24	28.76	1.3	-4	6.6
KTE-X19 vs. tisagenlecleucel	Small intestinal obstruction	1	1112	1	29365	2.79	0.17	44.62	1.39	-3.91	6.69
KTE-X19 vs. tisagenlecleucel	Pancreatitis necrotic	1	1112	1	29365	2.79	0.17	44.62	1.39	-3.91	6.69
liso-cel vs. tisagenlecleucel	Nausea	2	478	96	29270	1.21	0.3	4.92	0.27	-2.77	3.31
liso-cel vs. tisagenlecleucel	Vomiting	1	479	79	29287	0.84	0.12	6.03	-0.25	-5.55	5.05
liso-cel vs. tisagenlecleucel	Diarrhoea	1	479	64	29302	0.97	0.13	7.01	-0.04	-5.34	5.26
liso-cel vs. tisagenlecleucel	Gastrointestinal haemorrhage	1	479	20	29346	1.81	0.24	13.55	0.84	-4.46	6.14
liso-cel vs. tisagenlecleucel	Clostridium difficile colitis	1	479	23	29343	1.71	0.23	12.71	0.76	-4.54	6.06
liso-cel vs. tisagenlecleucel	Constipation	5	475	7	29359	8.97	2.84	28.36	2.99	1.33	4.64
liso-cel vs. tisagenlecleucel	Mucormycosis	2	478	9	29357	3.87	0.83	17.94	1.88	-1.16	4.93

liso-cel vs. tisagenlecleucel	Intestinal perforation	1	479	4	29362	2.65	0.3	23.79	1.37	-3.93	6.67
liso-cel vs. tisagenlecleucel	Small intestinal obstruction	1	479	1	29365	2.91	0.18	46.52	1.5	-3.8	6.8
liso-cel vs. tisagenlecleucel	Enteritisagenlecle	2	478	1	29365	4.84	0.44	53.5	2.19	-0.85	5.23

CAR-T, chimeric antigen receptor T-cell; axi-cel, axicabtagene-ciloleucel; liso-cel, lisocabtagene maraleucel; KTE-X19, brexucabtagene autoleucel; ROR, reporting odds ratios; IC, information component.

Table S3. Fatality rates in different gastrointestinal adverse events following tisagenlecleucel and axi-cel.

CAR-T products	PTs	Death reports	Total reports	Rate (%)
Tisagenlecleucel	Nausea	25	96	26.04
Tisagenlecleucel	Diarrhoea	24	64	37.50
Tisagenlecleucel	Vomiting	24	79	30.38
Tisagenlecleucel	Gastrointestinal infection	21	35	60.00
Tisagenlecleucel	Abdominal distension	20	29	68.97
Tisagenlecleucel	Mouth haemorrhage	19	19	100.00
Tisagenlecleucel	Dysphagia	17	33	51.52
Tisagenlecleucel	Gastrointestinal haemorrhage	16	20	80.00
Tisagenlecleucel	Oral pain	15	19	78.95
Tisagenlecleucel	Ascites	14	16	87.50
Tisagenlecleucel	Abdominal compartment syndrome	13	13	100.00
Tisagenlecleucel	Abdominal pain	13	28	46.43
Tisagenlecleucel	Gastrointestinal toxicity	11	19	57.89
Tisagenlecleucel	Gastrointestinal disorder	10	10	100.00
Tisagenlecleucel	Stomatitis	10	25	40.00
Tisagenlecleucel	Mucormycosis	9	9	100.00
Tisagenlecleucel	Upper gastrointestinal haemorrhage	8	8	100.00
Tisagenlecleucel	Pancreatitis	7	17	41.18

Tisagenlecleucele	Gastrointestinal bacterial infection	6	14	42.86
Tisagenlecleucele	Pancreatic enlargement	6	7	85.71
Tisagenlecleucele	Abdominal mass	5	8	62.50
Tisagenlecleucele	Abdominal discomfort	4	12	33.33
Tisagenlecleucele	Gastrointestinal oedema	4	5	80.00
Tisagenlecleucele	Haematochezia	4	6	66.67
Tisagenlecleucele	Incontinence	4	5	80.00
Tisagenlecleucele	Abdominal tenderness	3	4	75.00
Tisagenlecleucele	Clostridium difficile colitis	3	23	13.04
Tisagenlecleucele	Colitis	3	9	33.33
Tisagenlecleucele	Intestinal perforation	3	4	75.00
Tisagenlecleucele	Neutropenic colitis	3	4	75.00
Axi-cel	Gastrointestinal haemorrhage	14	21	66.67
Axi-cel	Abdominal pain	9	34	26.47
Axi-cel	Clostridium difficile colitis	7	20	35.00
Axi-cel	Vomiting	7	48	14.58
Axi-cel	Dysphagia	6	35	17.14
Axi-cel	Nausea	6	75	8.00
Axi-cel	Intestinal ischaemia	5	5	100.00
Axi-cel	Intestinal perforation	5	8	62.50
Axi-cel	Duodenal ulcer	4	4	100.00

Axi-cel	Gastrointestinal perforation	4	5	80.00
Axi-cel	Ascites	4	7	57.14
Axi-cel	Colitis	4	9	44.44
Axi-cel	Enterocolitis	3	4	75.00
Axi-cel	Gastric disorder	3	3	100.00
Axi-cel	Lip disorder	3	3	100.00
Axi-cel	Oral herpes	3	4	75.00
Axi-cel	Pancreatitis acute	3	3	100.00
Axi-cel	Pelvic pain	3	6	50.00
Axi-cel	Tongue ulceration	3	4	75.00
Axi-cel	Diarrhoea	3	56	5.36

CAR-T, chimeric antigen receptor T-cell; PTs, preferred terms; Axi-cel, axicabtagene-ciloleucel.