

Table S1 Corresponding SEER code of surgery

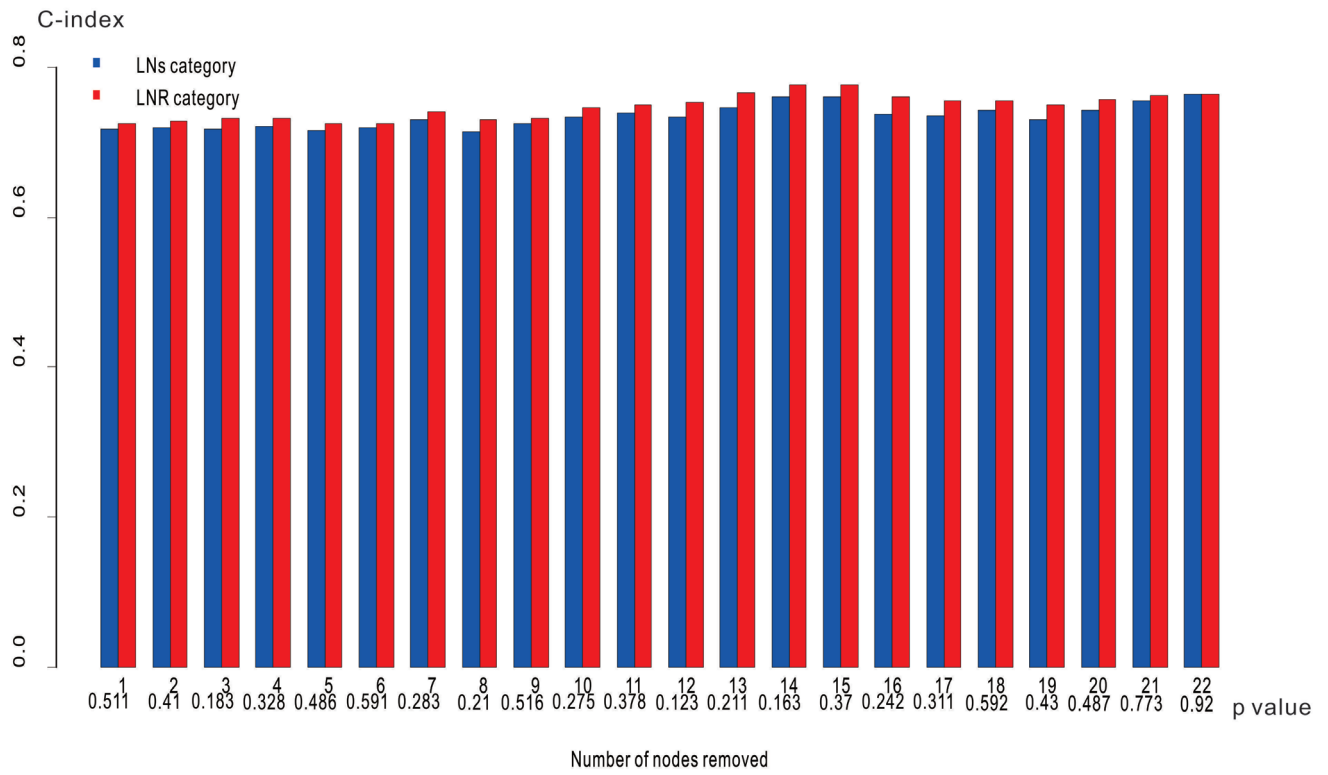
SEER site specific surgery code	Colon	Surgical definition
1988–1997		
0–9	No surgical procedure; incisional, needle, or aspiration biopsy; exploratory only or bypass surgery; non-cancer directed surgery, NOS; unknown if surgery done	No cancer-directed surgery/unknown
10	Local cancer destruction without pathology specimen	Local excision
20	Local surgical excision with pathology specimen	Local excision
30	Partial or subtotal colectomy	Radical resection
40	Hemicolectomy or greater; right/left colectomy	Radical resection
50	Total colectomy	Radical resection
60	Colectomy, NOS	Radical resection
70	Colectomy plus partial or total removal of other organs	Radical resection
80	Surgery of regional and/or distant site(s)/node(s) only	Unknown
90	Surgery, NOS	Unknown
1998–2011		
0	None; no cancer-directed surgery of primary site	No cancer-directed surgery
10–14	Local tumor destruction, NOS (without pathology specimen)	Local excision
20–27	Local tumor excision, NOS (with pathology specimen)	Local excision
30–31	Partial colectomy	Radical resection
40	Hemicolectomy or greater; right or left colectomy	Radical resection
50	Total colectomy	Radical resection
60	Total proctocolectomy	Radical resection
70	Colectomy or coloproctectomy WITH an en bloc resection of other organs; pelvic exenteration	Radical resection
80	Colectomy, NOS	Radical resection
90	Surgery, NOS	Unknown
99	Unknown if cancer-directed surgery performed; death certificate only	Unknown

Table S2 Calculation the cutoff of LNs

LN's threshold	Harrell's C statistic	P value
Step 1		
<2 versus \geq 2	0.568017955	7.09E-05
<3 versus \geq 3	0.591362003	6.43E-07
<4 versus \geq 4	0.595316392	2.52E-08
<5 versus \geq 5	0.58417669	1.29E-08
<6 versus \geq 6	0.589828753	3.68E-11
<7 versus \geq 7	0.588242065	2.46E-13
<8 versus \geq 8	0.578927465	1.28E-13
<9 versus \geq 9	0.575511563	1.11E-16
<10 versus \geq 10	0.568655097	0
<11 versus \geq 11	0.56457328	0
<12 versus \geq 12	0.561042282	0
<13 versus \geq 13	0.556960464	0
<14 versus \geq 14	0.543226979	1.11E-16
<15 versus \geq 15	0.534927695	1.16E-13
Step 2		
<5 versus \geq 5	0.597934839	3.06E-08
<6 versus \geq 6	0.608651151	6.55E-11
<7 versus \geq 7	0.611894407	3.83E-13
<8 versus \geq 8	0.612243807	5.64E-14
<9 versus \geq 9	0.613053594	0.00E+00
<10 versus \geq 10	0.613226239	0.00E+00
<11 versus \geq 11	0.61267953	0.00E+00
<12 versus \geq 12	0.612239697	0.00E+00
<13 versus \geq 13	0.611614887	0.00E+00
<14 versus \geq 14	0.607578286	0.00E+00
<15 versus \geq 15	0.604926955	1.11E-16
Step 3		
<11 versus \geq 11	0.61358386	0.00E+00
<12 versus \geq 12	0.613949703	0.00E+00
<13 versus \geq 13	0.614237444	0.00E+00
<14 versus \geq 14	0.613916818	0.00E+00
<15 versus \geq 15	0.613571528	0.00E+00

Table S3 Calculation the cutoff of LNR

LNR threshold	Harrell's C statistic	P-value
Step 1		
<0.03 versus ≥0.03	0.500645363	0.629704972
<0.04 versus ≥0.04	0.50472718	0.172937445
<0.05 versus ≥0.05	0.506083675	0.233295395
<0.06 versus ≥0.06	0.509129623	0.209956757
<0.07 versus ≥0.07	0.511221914	0.224023459
<0.08 versus ≥0.08	0.522612363	0.036852711
<0.09 versus ≥0.09	0.523335827	0.037783467
<0.1 versus ≥0.1	0.523122076	0.044784146
<0.03 versus ≥0.03	0.500645363	0.629704972
<0.04 versus ≥0.04	0.50472718	0.172937445
<0.11 versus ≥0.11	0.529801787	0.024468726
<0.12 versus ≥0.12	0.5279438	0.041564992
<0.13 versus ≥0.13	0.533678075	0.018733276
<0.14 versus ≥0.14	0.53162689	0.026393213
<0.15 versus ≥0.15	0.546499009	0.00178299
<0.16 versus ≥0.16	0.54538915	0.002176364
<0.17 versus ≥0.17	0.54879683	0.00161952
<0.18 versus ≥0.18	0.548513199	0.001629272
<0.19 versus ≥0.19	0.550058781	0.001498562
<0.2 versus ≥0.2	0.551542705	0.001130492
<0.21 versus ≥0.21	0.561556105	0.000254991
<0.22 versus ≥0.22	0.558777346	0.000521002
<0.23 versus ≥0.23	0.558440277	0.00052005
<0.24 versus ≥0.24	0.562896158	0.000215749
<0.25 versus ≥0.25	0.564125225	0.000163425
<0.26 versus ≥0.26	0.562896158	0.000494466
<0.27 versus ≥0.27	0.565395398	0.000371867
<0.28 versus ≥0.28	0.574808652	5.40E-05
<0.29 versus ≥0.29	0.579239869	1.50E-05
<0.3 versus ≥0.3	0.586268981	4.18E-06
<0.31 versus ≥0.31	0.588649013	2.31E-06
<0.32 versus ≥0.32	0.583819068	5.19E-06
<0.33 versus ≥0.33	0.585381093	3.47E-06
<0.34 versus ≥0.34	0.597470342	5.62E-08
<0.35 versus ≥0.35	0.597470342	5.62E-08
<0.36 versus ≥0.36	0.598350009	4.43E-08
<0.37 versus ≥0.37	0.597227817	4.94E-08
<0.38 versus ≥0.38	0.601482279	1.36E-08
<0.39 versus ≥0.39	0.602929207	8.29E-09
<0.4 versus ≥0.4	0.602978534	8.06E-09
<0.41 versus ≥0.41	0.61504312	5.24E-11
<0.42 versus ≥0.42	0.616161201	3.31E-11
<0.43 versus ≥0.43	0.617365604	1.10E-11
<0.44 versus ≥0.44	0.614755379	2.61E-11
<0.45 versus ≥0.45	0.61357975	1.39E-10
<0.46 versus ≥0.46	0.612938497	1.08E-10
<0.47 versus ≥0.47	0.612441116	1.34E-10
<0.48 versus ≥0.48	0.612075273	2.52E-10
<0.49 versus ≥0.49	0.612075273	2.52E-10
<0.5 versus ≥0.5	0.612075273	2.52E-10
<0.51 versus ≥0.51	0.62956995	1.11E-15
<0.52 versus ≥0.52	0.627107706	3.33E-15
<0.53 versus ≥0.53	0.623889113	1.18E-14
<0.54 versus ≥0.54	0.626084168	2.78E-15
<0.55 versus ≥0.55	0.627288572	1.78E-15
<0.56 versus ≥0.56	0.626692536	2.00E-15
<0.57 versus ≥0.57	0.626692536	2.00E-15
<0.58 versus ≥0.58	0.627498212	6.66E-16
<0.59 versus ≥0.59	0.627243355	6.66E-16
<0.6 versus ≥0.6	0.627243355	6.66E-16
<0.61 versus ≥0.61	0.62567722	1.11E-16
<0.62 versus ≥0.62	0.62567722	1.11E-16
<0.63 versus ≥0.63	0.625097627	1.11E-16
<0.64 versus ≥0.64	0.623473943	1.11E-16
<0.65 versus ≥0.65	0.621303551	2.22E-16
<0.66 versus ≥0.66	0.621895476	1.11E-16
<0.67 versus ≥0.67	0.620769174	0
<0.68 versus ≥0.68	0.620769174	0
<0.69 versus ≥0.69	0.622027015	0
<0.7 versus ≥0.7	0.622392857	0
<0.71 versus ≥0.71	0.620773284	0
<0.72 versus ≥0.72	0.610163848	0
<0.73 versus ≥0.73	0.609238965	0
<0.74 versus ≥0.74	0.604762531	1.11E-16
<0.75 versus ≥0.75	0.604762531	1.11E-16
<0.76 versus ≥0.76	0.599015924	1.11E-15
<0.77 versus ≥0.77	0.596631781	4.55E-15
<0.78 versus ≥0.78	0.5894588	9.29E-14
<0.79 versus ≥0.79	0.586618381	4.28E-13
<0.8 versus ≥0.8	0.586618381	4.28E-13
<0.81 versus ≥0.81	0.576350124	2.18E-11
<0.82 versus ≥0.82	0.573756341	6.53E-11
<0.83 versus ≥0.83	0.573756341	6.53E-11
<0.84 versus ≥0.84	0.56492268	1.35E-09
<0.85 versus ≥0.85	0.563738829	3.44E-09
<0.86 versus ≥0.86	0.563997797	1.97E-10
<0.87 versus ≥0.87	0.564293759	1.44E-10
<0.88 versus ≥0.88	0.564293759	1.44E-10
<0.89 versus ≥0.89	0.565091214	4.92E-11
<0.9 versus ≥0.9	0.560035187	9.26E-10
<0.91 versus ≥0.91	0.560639443	4.95E-11
<0.92 versus ≥0.92	0.558912995	1.65E-10
<0.93 versus ≥0.93	0.558094987	4.19E-10
<0.94 versus ≥0.94	0.553026628	8.41E-09
<0.95 versus ≥0.95	0.548385770	1.21E-07
<0.96 versus ≥0.96	0.546018070	4.38E-07
<0.97 versus ≥0.97	0.543966885	1.20E-06
<0.98 versus ≥0.98	0.543966885	1.20E-06
<0.99 versus ≥0.99	0.543966885	1.20E-06
Step 2		
<0.52 versus ≥0.52	0.62908079	8.88E-16
<0.53 versus ≥0.53	0.628287445	0
<0.54 versus ≥0.54	0.63005911	1.04E-14
<0.55 versus ≥0.55	0.630910003	7.66E-15
<0.56 versus ≥0.56	0.631781448	6.00E-15
<0.57 versus ≥0.57	0.631781448	6.00E-15
<0.58 versus ≥0.58	0.633068063	2.11E-15
<0.59 versus ≥0.59	0.633618882	1.78E-15
<0.6 versus ≥0.6	0.633618882	1.78E-15
<0.61 versus ≥0.61	0.635020594	3.33E-16
<0.62 versus ≥0.62	0.635020594	3.33E-16
<0.63 versus ≥0.63	0.635641293	2.22E-16
<0.64 versus ≥0.64	0.635653625	1.11E-16
<0.65 versus ≥0.65	0.635345331	2.22E-16
<0.66 versus ≥0.66	0.635657736	1.11E-16
<0.67 versus ≥0.67	0.640072511	0
<0.68 versus ≥0.68	0.640072511	0
<0.69 versus ≥0.69	0.640721984	0
<0.7 versus ≥0.7	0.640915182	0
<0.71 versus ≥0.71	0.641149486	0
<0.72 versus ≥0.72	0.639427148	0
<0.73 versus ≥0.73	0.639698447	0
<0.74 versus ≥0.74	0.638892771	0
<0.75 versus ≥0.75	0.638892771	0
<0.76 versus ≥0.76	0.638687242	0
<0.77 versus ≥0.77	0.638724237	0
<0.78 versus ≥0.78	0.637429401	1.11E-16
<0.79 versus ≥0.79	0.636804591	1.11E-16
<0.8 versus ≥0.8	0.636804591	1.11E-16
<0.81 versus ≥0.81	0.636097569	3.33E-16
<0.82 versus ≥0.82	0.63562074	5.55E-16
<0.83 versus ≥0.83	0.63562074	5.55E-16
<0.84 versus ≥0.84	0.634654751	1.11E-15
<0.85 versus ≥0.85	0.634938382	1.11E-15
<0.86 versus ≥0.86	0.635530307	2.22E-16
<0.87 versus ≥0.87	0.635702952	2.22E-16
<0.88 versus ≥0.88	0.635702952	2.22E-16
<0.89 versus ≥0.89	0.636089348	1.11E-16
<0.9 versus ≥0.9	0.635082253	4.44E-16
<0.91 versus ≥0.91	0.636081127	0
<0.92 versus ≥0.92	0.635875597	1.11E-16
<0.93 versus ≥0.93	0.635892039	1.11E-16
<0.94 versus ≥0.94	0.634889055	5.55E-16
<0.95 versus ≥0.95	0.633976504	1.55E-15
<0.96 versus ≥0.96	0.63353256	2.55E-15
<0.97 versus ≥0.97	0.633273593	3.44E-15
<0.98 versus ≥0.98	0.633273593	3.44E-15
<0.99 versus ≥0.99	0.633273593	3.44E-15



Comparison of predictive capacity of LNR and LNs for patients confined to T3-4 after considering the successively minimal number of LNs removed

Figure S1 Comparison of predictive capacity of LNR and LNs for patients confined to T3-4. LN, lymph node; LNR, lymph node ratio.