

Supplemental material

Supplemental Table 1: Definitions of delayed diagnosis.

Supplemental Table 2: Diagnosis codes used to identify specific conditions presents at the initial encounter.

Supplemental Table 3: Permissive model predicting delayed diagnosis

Supplemental Table 4: Strict model predicting delayed diagnosis

Supplemental Table 1: Definitions of delayed diagnosis.

Likelihood of delay	Definition
Near-definitely not	(1) there were no signs of the condition on the prior encounter; (2) an alternative explanation for the prior encounter symptoms is definite or almost definite; or (3) the time course makes the condition virtually certain not to have been present.
Probably not	It is very unlikely that the condition was present on the prior encounter, and symptoms, signs, and other data at that time mostly pointed away from the condition.
Possibly	(1) it is possible the condition was present, but there are factors for and against that theory; (2) determination is confusing; (3) there is limited detail from which to decide; or (4) there are some alternative explanations for the case's features, but they have similar likelihood to the condition.
Probably	More likely than not, the patient had the condition on the prior encounter. Evidence pointed toward the condition, or few alternative explanations existed.
Near-definitely	The patient almost definitely or definitely had the condition on the prior encounter. Generally, these cases have clear evidence that the condition was present on the prior encounter. Alternatively, there is no other plausible explanation for the symptoms/signs on the prior encounter.

Supplemental Table 2: Diagnosis codes used to identify specific conditions presents at the initial encounter.

Diagnosis	Code System	Diagnosis Codes
Abdominal pain	ICD-9	289.2, 787.3, 789.00, 789.01, 789.02, 789.03, 789.04, 789.05, 789.06, 789.07, 789.09
Abdominal pain	ICD-10	I88.0, I88.9, N83.202, R10.0, R10.11, R10.12, R10.13, R10.2, R10.30, R10.31, R10.32, R10.33, R10.84, R10.9
Constipation	ICD-9	564.00, 564.09
Constipation	ICD-10	K59.00, K59.09
Dehydration	ICD-9	276.51
Dehydration	ICD-10	E86.0
Fever	ICD-9	780.6
Fever	ICD-10	R50.9
Gastroenteritis	ICD-9	008.8, 009.0, 535.00, 535.50, 558.9, 787.01, 787.02, 787.03, 787.91
Gastroenteritis	ICD-10	A08.4, A09, K29.00, K29.70, K52.9, R11.0, R11.10, R11.2, R19.7
Genitourinary condition	ICD-9	603.9, 604.90, 620.8
Genitourinary condition	ICD-10	N44.03, N45.1, N47.6, N50.819, N70.91, N76.0, N83.20, N83.9, N89.8, N93.8, N93.9, N94.6
Head, ears, eyes, nose, or throat condition	ICD-9	034.0, 381.01, 382.00, 382.9, 388.70, 462, 463, 464.4, 465.9
Head, ears, eyes, nose, or throat condition	ICD-10	H66.43, H66.91, J02.0, J02.8, J02.9, J05.0, J06.9, J11.1, J34.89
Urinary tract infection	ICD-9	590.80, 595.0, 595.9, 599.0, 788.1, 791.9
Urinary tract infection	ICD-10	N30.00, N39.0, R30.0
Viral syndrome	ICD-9	057.9, 079.99
Viral syndrome	ICD-10	B34.9, B97.89

Supplemental Table 3. Permissive model predicting delayed diagnosis, derived from the derivation cohort only. The permissive model predicted delay with a definition of delay that included “possible,” “probable”, and “near-definite” delayed diagnosis cases.

Variable	Adjusted odds ratio (95% confidence interval)	p
Complex chronic condition	1.30 (0.52, 3.27)	0.58
Revisit interval, days (compared with 0)		
1	0.91 (0.31, 2.70)	0.86
2	0.33 (0.11, 0.99)	0.05
3	0.26 (0.06, 1.18)	0.08
4	0.08 (0.02, 0.34)	<0.001
5	0.04 (0.01, 0.18)	<0.001
6	0.05 (0.01, 0.26)	<0.001
7	0.04 (0.01, 0.24)	<0.001
Initial encounter diagnosis		
Abdominal pain	0.64 (0.27, 1.50)	0.30
Constipation	2.85 (0.86, 9.46)	0.09
Dehydration	NA	0.98
Fever	0.75 (0.24, 2.31)	0.61
Gastroenteritis or vomiting	3.90 (1.63, 9.30)	<0.001
Genitourinary problem	1.04 (0.19, 5.69)	0.96
Head, ear, eyes, nose or throat problem	0.33 (0.10, 1.08)	0.07
UTI or dysuria	2.35 (0.56, 9.83)	0.24
Viral syndrome	0.95 (0.26, 3.47)	0.94
None of the above	0.07 (0.02, 0.34)	<0.001
Final diagnosis of perforated appendicitis during diagnosis encounter	8.29 (3.20, 21.52)	<0.001
Diagnosis encounter LOS, days (compared with 0-1)		
2-3	0.93 (0.40, 2.17)	0.86
4-7	3.98 (1.31, 12.07)	0.01
>7	0.61 (0.20, 1.87)	0.39

LOS; length of stay; NA: could not be estimated; UTI: urinary tract infection

Supplemental Table 4. Strict model predicting delayed diagnosis, derived from the derivation cohort only. The strict model predicted delay with a definition of delay that included “near-definite” delayed diagnosis cases.

Variable	Adjusted odds ratio (95% confidence interval)	p
Complex chronic condition	0.79 (0.37, 1.69)	0.54
Revisit interval, days (compared with 0)		
1	0.76 (0.39, 1.49)	0.43
2	0.16 (0.08, 0.35)	<0.001
3	0.10 (0.04, 0.27)	<0.001
4	0.07 (0.03, 0.21)	<0.001
5	0.03 (0.01, 0.15)	<0.001
6	0.01 (0.00, 0.11)	<0.001
7	0.03 (0.00, 0.25)	<0.001
Initial encounter diagnosis		
Abdominal pain	0.95 (0.56, 1.61)	0.85
Constipation	0.90 (0.44, 1.83)	0.76
Dehydration	1.57 (0.55, 4.49)	0.40
Fever	0.64 (0.30, 1.37)	0.25
Gastroenteritis or vomiting	1.01 (0.59, 1.74)	0.96
Genitourinary problem	0.87 (0.16, 4.59)	0.87
Head, ear, eyes, nose or throat problem	0.84 (0.31, 2.23)	0.72
UTI or dysuria	0.12 (0.02, 0.66)	0.01
Viral syndrome	3.47 (1.38, 8.72)	0.01
None of the above	0.38 (0.15, 0.95)	0.04
Final diagnosis of perforated appendicitis during diagnosis encounter	2.90 (1.58, 5.30)	<0.001
Diagnosis encounter LOS, days (compared with 0-1)		
2-3	1.11 (0.56, 2.22)	0.76
4-7	1.29 (0.62, 2.69)	0.49
>7	1.34 (0.59, 3.07)	0.49

LOS; length of stay; UTI: urinary tract infection