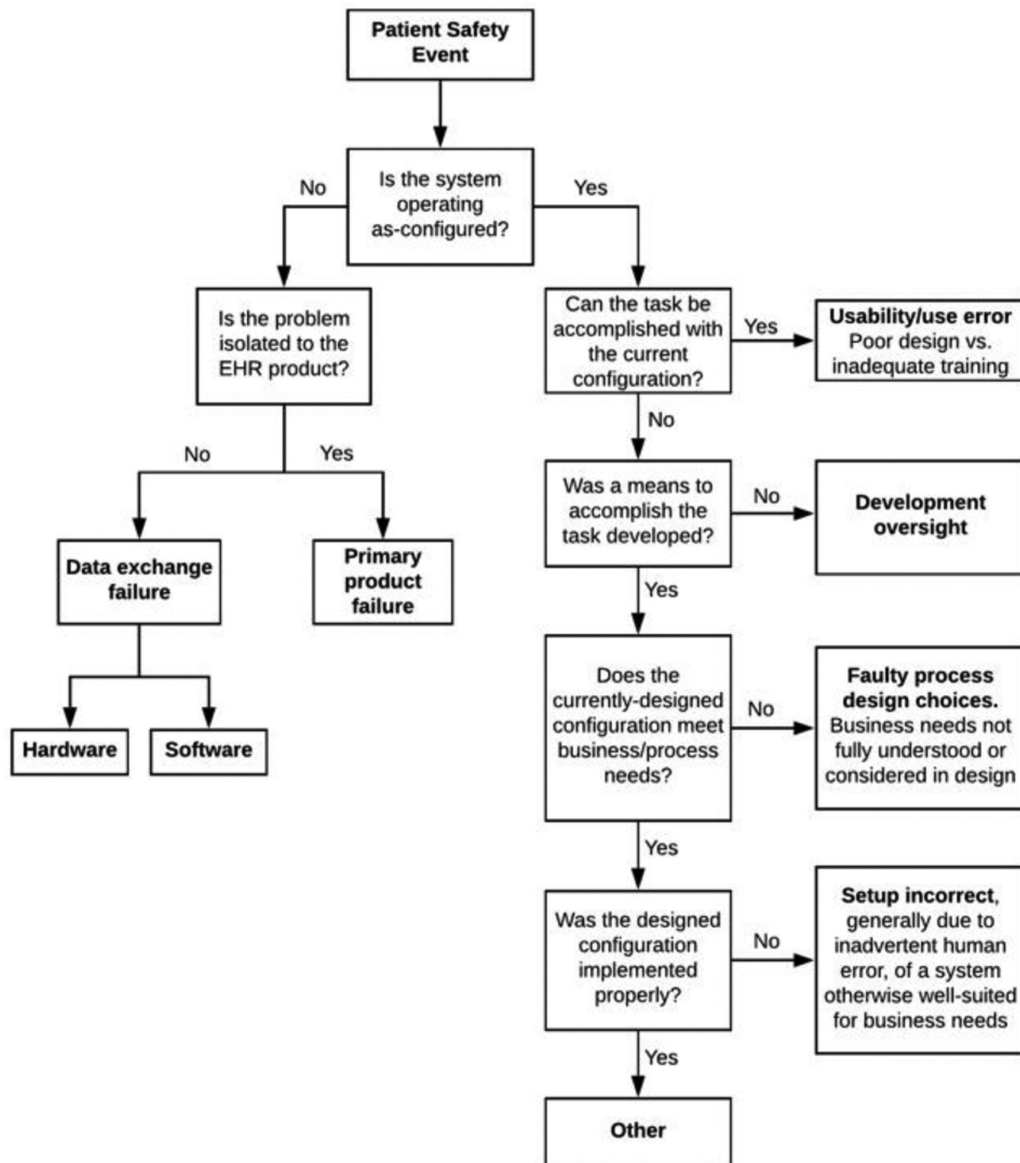
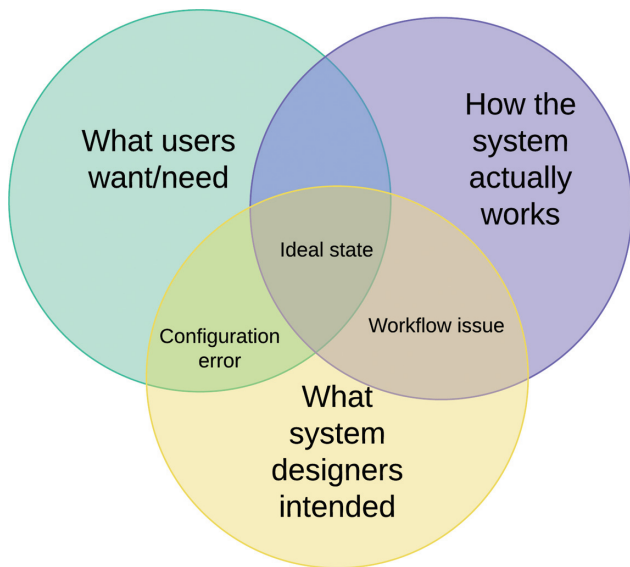


Supplementary Fig. S1 Plan-Do-Study-Act cycles.



Supplementary Fig. S2 HIT-related safety concern flowchart (modified version).



**Supplementary Fig. S3** Distinguishing between incorrect setup and faulty process/design choices.

**Supplementary Table S1** Classification of safety events according to sociotechnical domain

Sociotechnical domain	ERS reports ( <i>n</i> = 69)	HD tickets ( <i>n</i> = 140)	<i>p</i> -Value
Hardware and software	2 (3%)	12 (9%)	0.15
Clinical context	32 (46%)	105 (75%)	<0.01
Human–computer interface	24 (35%)	37 (26%)	0.26
People	1 (1%)	6 (4%)	0.43
Workflow and communication	46 (67%)	38 (27%)	<0.01
Organizational policies and procedures	2 (3%)	25 (18%)	<0.01
External rules, regulations, and pressures	1 (1%)	2 (1%)	1
System measurement and monitoring	0 (0%)	0 (0%)	1

Abbreviations: ERS, event reporting system; HD, help desk.

Notes: Because events may be classified under multiple domains, column percentages add up to greater than 100%.

Eleven ERS reports (out of 80 total) were not classifiable. All 140 HD tickets were classifiable. Only classifiable reports are considered in the denominator for percentages.

**Supplementary Table S2** Extended Magrabi’s classification with updated categories based on Magrabi et al<sup>15</sup>

Problem
1. Information input problems
1.1 Data capture device down or unavailable (machine)
1.2 Data entry and record manipulation (human)
1.2.1 Wrong input
1.2.1.1 Unit error
1.2.1.2 Data entered into wrong field
1.2.2 Missing data
1.2.3 Fail to update data
1.2.4 Fail to communicate/carry out task
2. Information transfer problems (machine)
2.1 Network down or too slow
2.2 Software interface issues
3. Information output problems
3.1 Output device down or unavailable (machine)
3.2 Record unavailable (machine)
3.3 Output/display error (machine)
3.4 Data retrieval error
3.4.1 Wrong record retrieved (human)
3.4.2 Missing data (i.e., did not look at complete record; Human)
3.4.3 Did not look (human)
3.4.4 Not alerted (machine)
3.4.5 Misreading or misinterpreting displayed information
4. General technical (machine)
4.1 Computer system down or slow
4.2 Software not available
4.3 Access problem (i.e., user unable to log in)
4.4 Software issue
4.4.1 Software functionality
4.4.2 Software system configuration
4.4.2.1 Default values in system configurations
4.4.3 Software interface with devices
4.4.4 Network configuration
4.5 Data loss
4.6 Hardware malfunction
5. Contributing factors (human)
5.1 Staffing/training
5.2 Cognitive load
5.2.1 Interruption
5.2.2 Multitasking
5.3 Fail to carry out duty
5.3.1 Fail to log off

**Supplementary Table S3** Classification of classifiable events according to the Magrabi classification

Problem	ERS reports ( <i>n</i> = 49)	HD tickets ( <i>n</i> = 139)
1. Information input problems		
1.1 Data capture device down or unavailable (Machine)	0 (0%)	1 (1%)
1.2 Data entry and record manipulation (Human)	2 (4%)	2 (1%)
1.2.1 Wrong input	9 (18%)	10 (7%)
1.2.1.1 Unit error	3 (6%)	2 (1%)
1.2.1.2 Data entered into wrong field	0 (0%)	0 (0%)
1.2.2 Missing data	2 (4%)	3 (2%)
1.2.3 Fail to update data	4 (8%)	1 (1%)
1.2.4 Fail to communicate/carry out task	4 (8%)	1 (1%)
2. Information transfer problems (machine)		
2.1 Network down or too slow	0 (0%)	0 (0%)
2.2 Software interface issues	0 (0%)	5 (4%)
3. Information output problems		
3.1 Output device down or unavailable (machine)	0 (0%)	0 (0%)
3.2 Record unavailable (machine)	0 (0%)	0 (0%)
3.3 Output/display error (machine)	0 (0%)	10 (7%)
3.4 Data retrieval error	0 (0%)	2 (1%)
3.4.1 Wrong record retrieved (human)	1 (2%)	0 (0%)
3.4.2 Missing data (i.e., did not look at complete record; human)	3 (6%)	0 (0%)
3.4.3 Did not look (human)	1 (2%)	0 (0%)
3.4.4 Not alerted (machine)	9 (18%)	3 (2%)
3.4.5 Misreading or misinterpreting displayed information	15 (31%)	16 (12%)
4. General technical (machine)		
4.1 Computer system down or slow	0 (0%)	1 (1%)
4.2 Software not available	0 (0%)	0 (0%)
4.3 Access problem (i.e., user unable to log in)	0 (0%)	2 (1%)
4.4 Software issue	0 (0%)	1 (1%)
4.4.1 Software functionality	10 (20%)	10 (7%)
4.4.2 Software system configuration	4 (8%)	78 (56%)
4.4.2.1 Default values in system configurations	1 (2%)	21 (15%)
4.4.3 Software interface with devices	1 (2%)	2 (1%)
4.4.4 Network configuration	0 (0%)	0 (0%)
4.5 Data loss	0 (0%)	0 (0%)
4.6 Hardware malfunction	1 (2%)	3 (2%)
5. Contributing factors (human)		
5.1 Staffing/training	5 (10%)	18 (13%)
5.2 Cognitive load	1 (2%)	1 (1%)
5.2.1 Interruption	0 (0%)	0 (0%)
5.2.2 Multitasking	2 (4%)	0 (0%)
5.3 Fail to carry out duty	2 (4%)	0 (0%)
5.3.1 Fail to log-off	0 (0%)	0 (0%)

Abbreviations: ERS, event reporting system; HD, help desk.

Note: Thirty-one ERS reports (out of 80 total) and 1 HD ticket (out of 140 total) were not classifiable. Only classifiable reports are considered in the denominator for percentages.

**Supplementary Table S4** Synthesis of categories proposed by Sittig et al<sup>6</sup> and categories generated through internal brainstorming

Categories proposed by Sittig et al	Categories proposed during internal brainstorming
Instances in which HIT fails during use or is otherwise not working as designed	Did not function as intended (programming issue)
Instances in which HIT is working as designed, but the design does not meet the user's needs or expectations	Inadequate training or design not intuitive
Instances in which HIT is well designed and working correctly, but was not configured, implemented, or used in a way anticipated or planned by system designers and developers	Faulty process design choices
	Setup incorrect/inaccurate
Instances in which HIT is working as designed, and was configured and used correctly, but interacts with external systems (e.g., via hardware or software interfaces) so that data are lost or incorrectly transmitted or displayed	Device integration
Instances in which specific safety features or functions were not implemented or not available (i.e., HIT could have prevented a safety concern)	-

Abbreviation: HIT, health information technology.

**Supplementary Table S5** Classification of safety events according to EHR-related safety concerns (modified version)

HIT-related safety concern (modified version)	ERS reports (n = 51)	HD tickets (n = 140)	p-Value
Primary product failure	0 (0%)	4 (3%)	0.58
Usability/use error	19 (37%)	28 (20%)	0.022
Setup incorrect/configuration error	4 (8%)	88 (63%)	<0.01
Faulty process/design choices	11 (22%)	18 (13%)	0.17
Data exchange failure not otherwise specified	0 (0%)	1 (1%)	1
Hardware data exchange failure	1 (2%)	4 (3%)	1
Software data exchange failure	0 (0%)	3 (2%)	0.57
Developmental oversight	2 (4%)	4 (3%)	0.66
Other	1 (2%)	3 (2%)	1

Abbreviations: ERS, event reporting system; HD, help desk.

Notes: Fifty-one ERS reports (out of 80 total) were not classifiable, and all 140 HD tickets were classifiable. Only classifiable reports are considered in the denominator for percentages.