

Appendix A. Emergency Department Information System - Request for Proposal

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Adapted from Model Request for Proposal compiled by Todd B. Taylor, MD, FACEP, and Mercy Hospital of Pittsburgh, Department of Emergency Medicine, Computerization Work Group

Vendor Instructions:

Please indicate the availability each feature by placing a check-mark (or where appropriate a date or dollar figure) in the appropriate column to indicate the status of the feature as defined below. Space is made available for you to write in features not listed under the appropriate categories. If you need more space to comment, please note the item by the section letter and item number (i.e. "ED Patient Log" would be "A-1").

N.B. Terms in the *Interface Section* are neologisms defined in *About Face: Essentials of User Interface Design* by Alan Cooper.

Standard	The item is a standard feature of your system and available without modifying the source code. (Note: Setting table parameters & data entry is not considered as a modification to source code.) The item must be fully operational at more than one site. (If in beta testing list as "planned".)
With Modification	The feature is available with minor software modifications or as a third party add-in (Please note details in comment field). List an estimate of the additional costs associated with this modification.
Planned Date	The feature is not currently available but you have definite plans to add it in the future. Please indicate by quarter of the year (e.g., 3Q05 or 1Q06).
Comments	Special requirements, considerations, or clarification associated with the feature.
Not Available	Leave all columns blank if the feature is not available and not <i>currently</i> under development.

#	Item	Standard	With Modification	Planned Date	Comments
A	Available Modules and Basic Features				
1	ED Patient Log				
2	Patient Registration Module				
3	Patient Tracking				
4	Single, rapid, secure sign-on				
5	Triage				
6	Nursing Care Documentation				
7	Physician Charting				
8	On-line historical chart availability				
9	Integration with Other Systems				
10	EKG/Laboratory/Radiology Interface				
11	Monitoring/Telemetry				
12	Point-of-Care Testing				
13	Hospital Pharmacy				
14	Hospital Medical Staff Roster				
15	On-call physician roster management				
16	Phone dialing & call logging				
17	Auto Fax Capable				
18	CQI/TQM Capability				
19	Report generation				
20	Concurrent risk management for on-line QA				
21	Patient Satisfaction Survey				
22	Critical Pathways				
23	Custom SQL queries				
24	Diagnosis Coding				
25	Trauma Registry				

Appendix A. Emergency Department Information System - Request for Proposal

#	Item	Standard	With Modification	Planned Date	Comments
26	Biosurveillance				
27	Disaster Management (e.g., massive casualties)				
28	Personnel Management				
29	Emergency Physician Scheduling				
30	Nurse/Ancillary Personnel Scheduling				
31	Hospital-Wide System Capability (i.e. ICU, med/surg, lab, pharmacy, etc. capability)				
32	Resource/Materials Management Capability				
33	Patient Billing				
34	Reference Material (i.e. On-line textbooks)				
35	Discharge Planning & Instructions				
36	Prescription Writing/Faxing				

B	Software Details				
1	Client-server architecture				
2	Operating System (i.e. Unix, Win NT, Win 95)				
3	Relational database subsystem (i.e. Oracle, MS SQL)				
4	Front end system (i.e. MS Access, Paradox)				
6	HL-7 compliance (with version number)				
7	POSIX compliance				
8	TCP/IP messaging				
9	Sub-second response times				
10	100% up-time				
11	Zero down-time for upgrades (no more than single server-reboot cycle)				
12	Real-time data transfer between applications and institutions				
13	Integrates multiple sites				
14	Secure methodology for off-site access to system				

C	Hardware Details (please cite type/numbers usually required)				
1	Recommended File Server				
2	Backup Server(s) or Methodology				
3	Infrastructure for instant re-routing on system failure, or during backups				
4	Work stations				
5	Desktop				
6	Bedside wall mounted LCD flat screen				
7	Bedside rack mounted				
8	Tablet PC				
9	Portable Data Assistant (PDA)				
10	Network Configuration				
11	Type (i.e. TPE, AUI, BNC)				
12	Topology (i.e. token ring, star)				

Appendix A. Emergency Department Information System - Request for Proposal

#	Item	Standard	With Modification	Planned Date	Comments
D	ED Log/Registration Features				
1	Customizable registration data input screens				
2	“Single-swipe” registration using provincial Medicare cards, with download of demographics from magnetic stripe				
3	Demographic registration download from hospital system				
4	Integrates optional quick-triage				
5	Allows pre-hospital “call-in” registration				
6	Allows bedside registration				
7	John/Jane Doe quick registration				
8	Merge John/Jane Doe charts with final chart				
9	CEDIS presenting complaints				
10	JCAHO Compliant ED log				
11	Data upload to hospital system				
12	Out-of-province liability forms produced/signed at registration				

E	Patient Tracking Features				
1	Automatic patient tracking via infrared or other method				
2	Patient movement creates location time stamp log				
3	Assign nurse to patient				
4	Assign same nurse to multiple patients in single step				
5	Assign doctor to patient				
6	Assign same doctor to multiple patients in single step				
7	Transfer multiple patients between providers in single step				
8	Anonymous login for infrequent users				
9	Electronic signature available for validation				
10	Accept and verify “after the fact” actions				

F	Status Board Displays				
1	Customizable fields on status board displays				
2	Text metaphor of the ED for patient location tracking				
3	Graphical metaphor of the ED for patient location tracking				
4	Alert of room status (i.e. clean, dirty, saved)				
5	Alert to signify individual patient triage status				
6	Alert to signify overall department status, i.e. Department Workload measurements				
7	Alert set to customizable thresholds for waiting times, etc.				
8	Can select sub-views of ED				
9	Sub-views offer graphical indication of number of patients in various categories in other parts of ED.				
10	Different default sub-views for specific PCs/tablet PCs/PDAs				
11	Different default sub-views for specific users/user groups: worklists per caregiver, station, or shift				
12	Nursing sub-views show orders due				
13	Displays flag when all pending actions are completed (i.e., patient ready for re-evaluation or disposition)				

Appendix A. Emergency Department Information System - Request for Proposal

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14	Monitor the return of lab tests and visually flag lab results that are delayed more than a specified amount of time				
15	Flag abnormal vital signs in an obvious way				
16	Flag critical lab values in an obvious way				
17	One-click display of lab values from personalized status screens				
18	Optional cascading windows or similar option for more than one patient in a room & available for all rooms				
19	Can use hallway positions as "rooms"				
20	Indicators for "out-of-department" patients available for all tracking screens.				
21	"Out-of-department" indicators allow access to full patient display on request				
22	Continuously-incremented length-of-stay indicator available				
23	"Quick lookup" when someone calls about a patient: by name; shows patient status				
24	Tracking board as "screen blanker" after set time period				
25	Visual Analog Indications Of:				
26	# patients in waiting room waiting to be brought to a room				
27	# patients in a room waiting to be seen by a physician				
28	# patients seen by physician but awaiting completion of nursing tasks				
29	# patients awaiting completion of diagnostic tests				

G	Triage				
1	Automated vital signs input (direct from automated monitors) with validation/correction				
2	Listing of currently-available triage algorithms				
3	Customizable algorithms for triage ordering of labs & x-rays by triage nurse				
4	Triage algorithms can be branching based on user choices				
5	Triage algorithms can display graphical elements (e.g., picture of ankle and foot to explain Ottawa criteria).				
6	Presenting complaint/triage information can trigger specific question prompts, i.e. SARS screening				
7	Automated entry of historical data from prior visits, including:				
8	Allergies				
9	Previous tetanus toxoid administration date, if logged				
10	Advance Directives				
11	Special needs				
12	Automated entry of common complaints				
13	Automated entry of common medications/dosages				
14	Automated entry of common past medical history				
15	Entry of textual data for uncommon complaints via:				
16	Keyboard				
17	Check off boxes				
18	Mouse				
19	Touch screen				
20	Pen Stylus				
21	Handwriting recognition				
22	Voice recognition				
23	Method for postponing detailed triage notes in urgent situations (e.g., Jane/John Doe)				

Appendix A. Emergency Department Information System - Request for Proposal

#	Item	Standard	With Modification	Planned Date	Comments
24	Management of incoming calls from referring physicians and flags patient icon/entry to show this status				
25	Management of incoming calls for patients not known to system & "attach" to patient record once patient arrives				
26	Location assignment from any terminal				
27	Assign rooms ahead of ambulance arrival				
28	System monitor at entrance directs EMS correct room (e.g., shows "Ambulance 235" over "Stretcher 10" on geographic display)				

H	Nursing Care Documentation/Ordering	Standard	With Modification	Planned Date	Comments
1	Same capability as "Triage" module				
2	Automated vital signs input (direct from automated monitors) with validation/correction				
3	Extended vital signs (e.g., orthostatics, mental status, GCS)				
4	Automated entry of nursing assessment				
5	Automated entry of common charting notations				
6	Entry of textual data for uncommon items				
7	Keyboard				
8	Check off boxes				
9	Mouse				
10	Touch screen				
11	Pen Stylus				
12	Handwriting recognition				
13	Voice recognition				
14	Automated entry of common medications/dosages				
15	Method for postponing detailed notes in urgent situations				
16	Method for entering notes for unknown patient (e.g., John Doe)				
17	Algorithm notation for common situations (e.g., cardiac arrest)				
18	Listing of all currently available algorithms provided				
19	Calculation of common drips (e.g. nitroglycerine)				
20	Document medications, including IVs				
21	Flag critical information for physician to review				
22	Document patient education				
23	Date/time stamp for each activity				
24	Bedside ordering (treatment, lab, x-ray)				
25	Label-printing for lab samples				
26	Auto-page porters for specimen pickup with status collected				
27	Print medication information, discharge instructions				
28	Incident reporting				

Appendix A. Emergency Department Information System - Request for Proposal

#	Item	Standard	With Modification	Planned Date	Comments
I	Physician Charting				
1	Same capability as nursing module				
2	Customizable for individual physicians				
3	Review & print all data collected to date				
4	Historical chart review				
5	Automatic entry with confirmation of chief complaint, medications, allergies, PMH, SOC, FH, etc.				
6	Automated entry of common history and physical exam items				
7	Entry of textual data for uncommon items				
8	Keyboard				
9	Check off boxes				
10	Mouse				
11	Touch screen				
12	Pen Stylus				
13	Handwriting recognition				
14	Voice recognition				
15	Integrated voice dictation/transcription				
16	Annotated anatomical drawings				
17	Document patient education				
18	Optional automated printing of bar code-labeled physician paper chart, for seamless auto-scanning as image file into history field of physician chart				
19	Automated scanning of paper charts produced during periods of system down-time, into electronic medical record				
20	Importing of digital images into documentation				
21	Listing of current algorithms available				
22	Algorithm ordering of labs & x-rays for common problems				
23	Algorithm charting for common situations & procedures (e.g., cardiac arrest, chest tube, intubation)				
24	Incorporation of Clinical Practice Guidelines				
25	Flag potentially inappropriate orders; ask for confirmation				
26	Automatic calculation of clinical scoring systems (pneumonia severity index, Glasgow Coma Score, Apache score, etc.)				
27	Automated entry of common medications/dosages				
28	Calculation of common medication dosages by weight				
29	Charting & Ordering (treatment, lab, x-ray)				
30	Bedside				
31	Desktop Workstation				
32	Mobile/wireless				
33	Flag "stat" critical nursing orders				
34	Advance Directives				
35	Free text ordering for irregular orders				
36	Incident reporting				

Appendix A. Emergency Department Information System - Request for Proposal

#	Item	Standard	With Modification	Planned Date	Comments
J	Pharmacy Ordering/Prescription Writing				
1	Default order "sets"				
2	Customizable orders for individual physicians/groups				
3	Free text orders, i.e. for irregular/untemplated orders				
4	Quick selection of common medications				
5	Automatic calculation of dose based on weight				
6	Automatic adjustment of dose based on renal function, if available in lab system				
7	Include patient drug information with discharge instructions				
8	Allergy checking				
9	Drug interaction checking including patients current meds				
10	Checking lab values for drug contraindications, i.e. elevated creatinine				
11	Ability to check New Brunswick Prescription Drug, Blue Cross, etc. formularies for coverage				
12	Relative cost data with suggested alternative				
13	Recommended drugs for common treatments				
14	Electronic signing of verbal physician orders				

K	Results Reporting				
1	"One-click" call-up of results from tracking displays				
2	Reporting of laboratory values to personalized displays (i.e. workstations, tablet PC, PDA, etc.)				
3	Alerts for critical laboratory values to personalized displays (i.e. physician's tablet PC, PDA, pager, etc.)				
4	Highlights critical lab values, abnormal values				
5	Graphing of numeric results as trend over time				
6	Ability to copy results to other parts of chart, i.e. consultant letters				
7	Electronic signing of results, discharge summaries, etc.				
8	Incorporates Point-of-Care test results				
9	Accepts lab data input from ED personnel (urinalyses, urine pregnancy tests, rapid strep tests) and can track separately from patient record for QA purposes				
10	Radiology Readings:				
11	Accepts x-ray interpretations by emergency physician				
12	Allows radiologists to flag significant discrepancies on-screen and alert on-duty ED personnel				
13	For flagged discrepancies, will seek out and input radiology reading from radiology transcription system				

L	Discharge Planning & Instructions				
1	Multilingual				
2	French				
3	Other				
4	Basic Discharge Data Set				
5	# of instructions included				
6	Based on (e.g., Ohio ACEP set, proprietary, etc.)				

Appendix A. Emergency Department Information System - Request for Proposal

#	Item	Standard	With Modification	Planned Date	Comments
7	Customizable to individual physician				
8	Ability to initiate discharge planning (i.e. patient education) at any point (e.g., from triage)				
	Work/school release				
9	Physician referral with automatic phone/address information				
10	Ability to provide directions to common locations (e.g., nearby 24-hour pharmacies)				
11	Ability to manage/print common forms (e.g., AMA, informed consents, transfer)				
12	Can log patient's signature electronically for above, to acknowledge receipt of discharge instructions, etc.				
13	System can be set to require a physician signature on any EKG prior to patient leaving the ED				

M	Integration with Other Systems	Standard	With Modification	Planned Date	Comments
1	Emergency Department record merges seamlessly into Hospital Information System/inpatient record				
2	Integrates with hospital's lab-ordering & reporting system				
3	Integrates with hospital radiology dictation/reporting/digital imaging display systems				
	Order "panels" of labs via lab-ordering features				
4	Automatically fax or hard-copy visit summary to primary-care physician				
5	Automatically fax or hard-copy visit summary to consultants or clinics				
6	"One-touch" buttons for consulting/paging with easily-updated daily on-call table				
7	Print order requisitions in all departments, where required				
8	Provide a list commercial systems that have been integrated:				
9	Eclipsys E7000 HIS				
10	Cerner laboratory				
11	Cerner pharmacy				
12	Agfa IMPAX				
13	Meditech Payroll/Personnel				
14	Datex-Ohmeda monitoring				
15	SpaceLabs monitoring				
16	HP PageWriter XLI cardiographs				
17	Medtronic LIFEPAK 12				
18	Pulmonetic Systems LTV 1000 ventilator				
19	Puritan Bennett 7200 ventilator				
20	BiPAP Vision ventilator				
21	Nellcor N-20 oximetry				
22	capnography				
23	Burdick Spirotouch				
24	Abbott LifeCare i.v. infusion pumps				
25	Baxter i.v. infusion pumps				
26	i-STAT				
27	Bayer Clinitek				
28	SMS messaging				
29	Access to hospital intranet: library services, Micromedex, etc.				
30	Access to Internet: PubMed, ncemi.org, etc.				

Appendix A. Emergency Department Information System - Request for Proposal

#	Item	Standard	With Modification	Planned Date	Comments
N	CQI/TQM Capability				
1	Concurrent risk management for on-line QA				
2	Automatically track QA parameters for delayed analysis				
3	Critical Pathways				
4	Follow-up & call back tracking				
5	Patient Satisfaction Survey				
6	User defined chart flags				
7	Census Analysis (# of patients in ED by hour, shift, day, week, month, year, etc.)				
8	Number & percentages of patients:				
9	seen in different ED areas				
10	by disposition (i.e. admit, transfer, discharge)				
11	by acuity				
12	by type of diagnosis				
13	Sort & Report By:				
14	disposition (i.e. admit, transfer, discharge)				
15	acuity				
16	type of diagnosis				
17	patients seen by a particular doctor or nurse				
18	death reports				
19	reportable diseases				
20	return visits within a specified time frame				
21	Custom Queries:				
22	relational database: Note name if commercial product				
23	database dictionary of all tables, fields, result types/names				
24	decryption key(s) for any encrypted data fields				
25	Query by Example (QBE)				
26	allows user-entered SQL queries on all data fields				
27	automatic scheduled periodic SQL queries, with automatic alerts for specified abnormals (i.e. for biosurveillance)				
28	Time Capture Log				
29	Patient arrival				
30	Triage				
31	Registration				
32	To room				
33	Seen by physician				
34	Orders given				
35	IV starts, drugs administered, other treatments				
36	Labs drawn and sent				
37	Labs expected back (user-customizable time frame)				
38	Labs back				
39	Time to x-ray, etc.				
40	Back from x-ray, etc.				
41	Phone consult ordered (and name or service)				
42	Consultant paged				
43	Consultant answered				
44	Consultant arrived				
45	Disposition decision made				
46	Admitting called				
47	Bed ready				
48	Patient disposition completed				
49	Time to X-ray report by radiologist				

Appendix A. Emergency Department Information System - Request for Proposal

#	Item	Standard	With Modification	Planned Date	Comments
0	Diagnosis/Intervention Coding				
1	Automatic ICD-9 coding from diagnosis				
2	Automatic ICD-10-CA coding from diagnosis				
3	Automatic CCI (Canadian Classification of Health Interventions) coding from orders & procedure notes				
4	Will integrate and automatically produce local procedural coding systems (i.e. New Brunswick Medicare)				
5	Supports NANDA International Taxonomy II for nursing diagnoses				
6	Supports current Nursing Intervention Classifications (NIC) and Nursing Outcomes Classifications (NOC)				
7	Integration with Canadian Institute of Health Informatics databases:				
8	Canadian Medication Incident Reporting and Prevention System (CMIRPS)				
9	Canadian Organ Replacement Register (CORR)				
10	Continuing Care Reporting System (CCRS)				
11	Hospital Morbidity Database (HMDB)				
12	National Ambulatory Care Reporting System (NACRS)				
13	National Prescription Drug Utilization Information System (NPDUIS)				
14	National Trauma Registry (NTR)				

P	Patient Billing				
1	Automatic posting of charges & supplies				
2	Automatic charge capture				
3	Billing review at time of service				
4	Interface with standard billing software				

Q	Reference Material				
1	On-line textbooks				
2	Emergency Drug Reference				
3	Dosage information				
4	ACLS algorithms				
5	Hospital policy and procedure repository				
6	Hospital forms repository (e.g., AMA, Informed Consent)				
7	Critical pathways				
8	Patient education databases				

Appendix A. Emergency Department Information System - Request for Proposal

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R	Hospital Personnel Management				
1	Emergency Physician Scheduling				
2	Nurse/Ancillary Personnel Scheduling				
3	Acuity based staffing reports				
4	ED staff addresses and phone numbers on secured system				
5	Medical Staff Roster				
6	On-line hospital medical staff roster				
7	On-call physician roster management				
8	Sort by specialty				
9	Sort by managed care plan				
10	Sort by office location				
11	One-touch dialing/paging for all staff				
12	Users able to log suggested corrections to any data table for later review/approval by system administrator				

S	Trauma Registry				
1	Injury Severity Score				
2	Revised Trauma Score				
3	Weighted Trauma Score				
4	Trauma Score-Injury Severity Score (TRISS)				
5	Glasgow Coma Score				
6	Pediatric Glasgow Coma Score				
7	Probability of survival calculations				
8	Database for capture of standard trauma data				

T	Resource/Materials Management Capability				
1	Supply ordering and maintenance				
2	Restock/resupply lists				
3	Equipment tracking (i.e. EMS equipment left with patient flagged for return, sign out equipment borrowed by other departments)				
4	Automatic equipment tracking (i.e. infrared system similar to that used to track patients)				
5	Maintenance schedule tracking				

Appendix A. Emergency Department Information System - Request for Proposal

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U	Hospital-Wide System Capability Modules				
1	Can relevant parts of the Emergency Department record be retrieved by receiving or consulted staff in:				
2	ICU				
3	Medical/Surgical Floor				
4	Surgical Unit				
5	Laboratory				
6	Pharmacy				
7	Radiology				
8	Occupational Health				
9	Outpatient Clinic				
10	Off-site Primary Care Providers				
11	Off-site Consultants				

V	Disaster Management				
1	Method for handling a disaster (e.g., massive casualties)				

W	Patient Record Management				
1	Archive Capacity expressed in # of patient records				
2	Concurrent charting by doctor, nurse, clerk, etc.				
3	Post discharge addenda				
4	Electronic signature				
5	Records available in on-line storage for up to ?# months				# Months: _____
6	Printout of all logged activity for printed chart				
7	Scanned-image for paper based documents (e.g., EMS, police reports, outside documents)				
8	Digital image data storage				
9	EKG				
10	Radiology				
11	Photographs				

X	Security				
1	Security lock out to avoid alterations to chart after completion				
2	Option to append notes to chart after completion				
3	Login for each interaction				
4	Login at terminal until logout				
5	Login allowed only by those scheduled to work				
6	Login from pick list				
7	Automatic login via infrared badge, swipe card, finger print, etc.				
8	Automatic logout after user defined time period				

Appendix A. Emergency Department Information System - Request for Proposal

#	Item	Standard	With Modification	Planned Date	Comments
9	Automatic logout after task completion				

Y	User Interface				
1	Direct-manipulation for common actions, e.g., drag-and-drop:				
2	Moving patients				
3	Applying nurses to patients				
4	Applying physicians to patients				
5	Changing patient status				
6	Entering orders				
7	Modal option for drag & drop (i.e., can pick up once and drop multiple times, e.g., for applying nurse to multiple patients)				
8	Other options for batch reassignment of patients to a new nurse or physician				
9	System knows which nurse is assigned to which area, and offers to change nurse to new area nurse when patient transferred from one area to another				
10	Charged cursor for drag-and-drop operations				
11	Chord-click and ESC cancel for drag-and-drop with visual stamp of cancellation				
12	Free cursor hinting to indicate pliancy, or active visual hinting				
13	Pedagogic vector for all actions				
14	Keyboard vector for all actions				
15	Pedagogic vector has teaching link to: direct manipulation, keyboard and button shortcuts				
16	Popup help ("tooltips") for all screen items				
17	Indexed context-sensitive hypertext help				
18	Help system includes tutorial w/ screen shots of major screens.				
19	Help system has "stay on top" option for at selected dialog box				
20	Data-entry dialog boxes offer "memory" of recent entries				
21	Monocline grouping of pedagogic vector (i.e., no menus more than 2 deep)				
22	Interface totally avoids dialog boxes with meta-questions				
23	Vendor commits to removing excise tasks found by users				
24	Status bar with hints				
25	Uses standard Windows95 button icons for standard functions				
26	Alphabetical find-by-typing/arrow-key selection for long lists				
27	One-touch (one-click) access to common secondary programs				

Z	Installation & Training				
1	Average installation time required				Days:
2	Typical amount of training time necessary for each end user				Hours:
3	Per hour cost for additional training after initial training period				

Appendix A. Emergency Department Information System - Request for Proposal

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AA	Fault Tolerance				
1	Average mean time between failures based on past experience				Months:
2	Zero downtime via redundancy, mirroring, instant re-routing				
3	Standby off-site disaster recovery				
4	Method for rapid recovery from software crashes				
5	Support days/hours:				Days: Times:
6	Anticipated longevity of current product				
7	Will the company continue to support/upgrade current hardware platforms?				

AB	Company Business History				
1	Year established:				19__
2	Corporate structure (e.g. publicly traded, privately owned):				
3	Number of full time employees:				
4	Number of current installations (excluding alpha/beta sites):				
5	Number of Canadian installations (excluding alpha/beta sites):				