

## Penn Highlands Elk Streamlines 700 Hospital Workflows to Improve Patient Care Using iatricSystems™ Visual SmartBoard™



**OBJECTIVE:** Penn Highlands Elk knew that its mission of excellence in healthcare depended on finding a better way to give clinicians the information they need. Rather than relying on static paper reports that became obsolete the moment they were printed, Penn Highlands Elk wanted to present relevant information at a glance, on an interactive screen updated in real time.

**SITUATION:** Penn Highlands Elk, (formerly Elk Regional Health Center) is a small, rural hospital in North Central Pennsylvania. Early in the last decade, Penn Highlands Elk faced a challenge that many hospitals have experienced: clinicians have to make fast, effective decisions, but were stymied by the need to look up records in multiple systems and sift through paper reports with highlighters to assemble information.

**SOLUTION:** Penn Highlands Elk uses iatricSystems™ Visual SmartBoard™, a data visualization and workflow management tool that pulls information from hospital IT systems and presents real-time, color-coded views of data in meaningful ways. Static paper reports have been replaced by interactive "SmartBoards" customized for different clinical and administrative workflows. Using the flexible platform, SmartBoards have been deployed throughout the hospital — in pre-registration, nursing, infection control, cardiology, lab, pharmacy, discharge, long-term care, and many other departments.

**RESULTS:** Using Visual SmartBoard, Penn Highlands Elk has seen a seismic shift in the way it provides information to people who need it and the way those individuals interact with that information. More than 700 SmartBoards have streamlined workflows in virtually every hospital department, improving patient care and safety, staff efficiency, and quality measures. Penn Highland Elk is rolling out new SmartBoards on an ongoing basis to support additional workflows and user requirements.

*"Not having to run reports...being able to see all that data on one screen... creating alerts based on selected criteria — that's power."*

– Derrick Goode  
Clinical Informatics  
Penn Highlands Elk



Penn Highlands Elk faced a challenge familiar to many hospitals: how to bring together information so clinicians could make fast, effective decisions about patient care. In response, the organization chose iatricSystems Visual SmartBoard™ to pull data from multiple systems and provide color-coded, real-time views of relevant information, customized for different workflows. Penn Highlands Elk has deployed more than 700 SmartBoards to meet an immense variety of needs throughout the hospital. “Not having to run reports...being able to see all that data on one screen...creating alerts based on selected criteria — that’s power,” says Derrick Goode, Clinical Informatics, Penn Highlands Elk.

### **Streamlining Workflows and Improving Care**

Visual SmartBoard provides Penn Highlands Elk with a flexible platform for creating, modifying, and repurposing SmartBoards wherever they can make a difference in patient care. Over time, Derrick has been able to do much of the work himself, calling on iatricSystems as needed for technical expertise and knowledge of what works at other hospitals. With this collaboration, Penn Highlands Elk has deployed SmartBoards to streamline and improve workflows in virtually every hospital department. Here are just a few examples:

**Nursing:** SmartBoards assist with clinical decision-making and patient monitoring. The ability to document directly into the EHR from within a SmartBoard improves efficiency because information is visible immediately to all staff.

**Lab:** SmartBoards improve patient care by monitoring lab results and patient medications, and alerting staff to STAT orders. By seeing peaks and troughs, and interactions between medications, pharmacists can adjust medications appropriately.

**Pharmacy:** Many SmartBoards are used to support the hospital’s paperless pharmacy initiative. They help pharmacy staff track and manage orders, including orders awaiting lab results and/or physician clarification.

**Respiratory Therapy:** SmartBoards show patients on respiratory medication, next med due, attending physician, and similar information. They also are used for managing STAT orders, with automatic alerts to RT staff.

**Quality/Sepsis:** Quality managers use SmartBoards to track Congestive Heart Failure, Acute Myocardial Infarction, and Surgical Care Improvement Project to diagnose patients and alert the care team when a critical protocol is necessary. To help meet the new CMS Inpatient Quality Reporting (IQR) requirement for sepsis, a SmartBoard monitors patients that are possible, probable, or positive, allowing physicians to intervene and prevent a sepsis crisis.

“iatricSystems has been a great, great resource for us.”

– Mary Ann Schwabenbauer  
Chief Information Officer  
Penn Highlands Elk





### Sepsis SmartBoard

Screen Results Last Review	Location Status	Name Reason for Visit	Acct # Unit #	Age/Sex Allergies	Attend Admit	Wgt Hgt	All Labs All Mic	WBC Hgb	Glu Poc Glu	Plt Inr	TBili Creat	Lactate Apt	AMS Oliguria	Temp (F) BP
Positive Monitoring	ST2 MSP29-1 ADM IN	TESTIATRIC.DEMOVFS TEST	V00028498 M000000746	8 F	CARDA CARDA	65 lb 2 oz 4 ft 0 in	***	22.8 H 10.8 L	384 H 2.0 H	254 2.0 H	1.15 H	2.0		98.5 152/85
Positive Review	PORTAL PORTA ADM IN	TESTIATRIC.VFSDEMO SICK AND TIRED	V00028910 M000000814	48 M	CARDA CARDA	125 lb 0 oz 5 ft 9 in	***	22.8 H 384 H	384 H 2.0 H	2.0 H 4.80 H	4.80 H	2.4 H		97.0* 135/66
Positive Monitoring	ST1 MSP17-1 ADM IN	TESTIATRIC.LISA CHEST PAIN	V00029900 M000000861	50 F	LOVST LOVST	165 lb 10 oz 5 ft 5 in	***	22.8 H 384 H	384 H 2.0 H	2.0 H 4.80 H	4.80 H		Y	99.6 145/70*
Positive Review	Z.SCRIPT Z100-ADM IN	TESTIATRIC.BOBBI CP	V00028985 M000000816	32 F	ZIMER ZIMER	165 lb 0 oz 5 ft 6 in	***	26.8 H 350 H	350 H		2.20 H			99.5 140/72*
Probable Review	ST1 202-1 ADM IN	LITTLE CRIPPLED.FREDDI C abdominal pain	V00018184 M000000081	10 M	PWMDOC PWMDOC	6 lb 0 oz 0 ft 5 in	***	16.9 H 185 H	185 H	3.5 H	2.80 H		2900	99.3* 120/80
Probable Review	ST1 SPU.B-5 ADM IN	TESTIATRIC.AUBREY CVA,DVT	V00029280 M000000807	49 F	LOVST LOVST	Unknown Unknown	***	15.0 H		1.8 H				101.5* 152/85*
Probable Review	PORTAL PORTA ADM IN	TESTIATRIC.CAROLYN SICK AND TIRED	V00028225 M000000768	47 F	SMIJA SMIJA	150 lb 5 ft 6 in	***	22.0 H 12.4	900 *H 800 H		4.20 H			103.0* 125/82
Probable Review	ST1 SPU.A-5 ADM IN	TESTIATRIC.WILL CAUGHT WITH HAND IN COO	V00028290 M000000773	33 M	CARDA LOVST	Unknown Unknown	***			2.8 H				104.1* 138/120*
Possible/SIRS+ Review	ST1 228-2 ADM IN	TESTIATRIC.CAROLYN SICK AND TIRED	V00016352 M000000543	47 F	SMIJA SMIJA	150 lb 5 ft 4 in	***	16.6 H 9.2 L	244 H 388		1.01			104.0* 140/80*
Possible/SIRS+ Monitoring	NUR 999-9 ADM IN	TESTIATRIC.ORDEREASE PNEUMONIA, FLU, DYSPNEA	V00028449 M000000781	49 F	LOVST LOVST	152 lb 10 oz 5 ft 7 in	***	18.5 H 250 H	250 H 440 H	1.4	1.05 H			102.3* 150/69*
Possible/SIRS+ Review	ST1 MSP25-1 ADM IN	CCDTEST.REX shortness of breath	V00027409 M000000414	17 M	IATRIS IATRIS	109 lb 0 oz 4 ft 11 in	***	3.0						101.0* 120/75
Possible/SIRS+ Review	ST1 222-1 ADM IN	CUPIID.ARWOW ABDOMINAL PAIN	V00018119 M000000580	87 M	PWMDOC PWMDOC	180 lb 0 oz Unknown	***							103.1* 92/68
Possible/SIRS+ Review	PORTAL PORTA ADM IN	TESTGRANT.MARY SINUSITIS	V00028605 M000000790	26 F	ZIMER CARDA	142 lb 4 oz Unknown	***	19.1 H 12.4		255				102.0* 125/88
Possible/SIRS+ Review	PORTAL PORTA ADM IN	TESTIATRIC.ALLISON SHORNESS OF BREATH	V00028233 M000000769	80 F	CARDA CARDA	Unknown Unknown	***	14.0 H						98.2 125/85
Possible/SIRS+ Review	ST1 234-1 ADM IN	TESTIATRIC.JANET VFS Testing	V00015495 M000000526	49 F	CARDA CARDA	145 lb 5 ft 6 in	***		220 H					102.4
Possible/SIRS+ Review	PORTAL PORTA ADM IN	TESTIATRIC.MDAORDER PNEUMONIA, ASTHMA	V00028878 M000000812	14 M	MDACCESS MDACCESS	440 lb 15 oz Unknown	***	18.2 H	98	300 1.1	1.10	26.0		98.4 114/72
Possible/SIRS+ Review	ST1 MSP20-1 ADM IN	TESTSCHNEIDER.MICHELLE PAIN IN HEAD	V00029017 M000000819	47 F	CARDA CARDA	111 lb 5 ft 4 in	***	23.2 H						104.2* 110/54*

Screen Results Last Review	Location Status	Plt Inr	TBili Creat	Lactate Apt	AMS Oliguria	Temp (F) BP	SpO2 O2	Pulse Resp	Diabetic	Surg24 Surg24Q	Vaccine Steroids	BetaBlock Antibiotic	Criteria 1 Score	Criteria 2 Score	Criteria 3 Score	Comments
Positive Monitoring	ST2 MSP29-1 ADM IN	254 2.0 H	1.15 H	2.0		98.5 152/85	91	88 22				***	3 2	2 7	2	NOTIFIED ATTENDING
Positive Review	PORTAL PORTA ADM IN	2.0 H	4.80 H	2.4 H		97.0* 135/66	70	66 22					3 3	3 7	1	PATIENT ADVSED OF
Positive Monitoring	ST1 MSP17-1 ADM IN	2.0 H	4.80 H		Y	99.6 145/70*	91	72 16		Y			3 2	3 6	1	
Positive Review	Z.SCRIPT Z100-ADM IN		2.20 H			99.5 140/72*	95	88 16				***	2 1	2 4	1	
Probable Review	ST1 202-1 ADM IN	3.5 H	2.80 H		2900	99.3* 120/80	98	88 22					3 2	2 5	0	CONTACTED FAMILY
Probable Review	ST1 SPU.B-5 ADM IN	1.8 H				101.5* 152/85*	97	88 24					3 1	3 4	0	
Probable Review	PORTAL PORTA ADM IN	800 H	4.20 H			103.0* 125/82	95	72 18				***	3 1	3 4	0	
Probable Review	ST1 SPU.A-5 ADM IN	2.8 H				104.1* 198/120*	88	105 50*					3 1	3 4	0	
Possible/SIRS+ Review	ST1 228-2 ADM IN	388	1.01			104.0* 140/80*	109	56* 26*				***	4 0	4 5	1	
Possible/SIRS+ Monitoring	NUR 999-9 ADM IN	440 H 1.4	1.05 H			102.3* 150/69*	93	80 32*				***	4 0	4 5	1	FAMILY CONTACTED ..
Possible/SIRS+ Review	ST1 MSP25-1 ADM IN					101.0* 120/75	95	70 25*					3 0	3 4	1	
Possible/SIRS+ Review	ST1 222-1 ADM IN					103.1* 92/60	89	118* 28*					3 0	3 3	0	
Possible/SIRS+ Review	PORTAL PORTA ADM IN	255				102.0* 125/88		78 32*					3 0	3 3	0	
Possible/SIRS+ Review	PORTAL PORTA ADM IN					98.2 125/85		150* 20					3 0	3 3	0	
Possible/SIRS+ Review	ST1 234-1 ADM IN					102.4 89	Y	72 14			***	***	2 0	2 3	1	
Possible/SIRS+ Review	PORTAL PORTA ADM IN	300 1.1	1.10	26.0		98.4 114/72		68 30*					2 0	2 3	1	
Possible/SIRS+ Review	ST1 MSP20-1 ADM IN	1.2				104.2* 110/54*		68 20					3 0	3 3	0	



**Long Term Care:** Pinecrest Manor, Elk’s long-term care facility, uses SmartBoards to improve their Minimum Data Set (MDS) quality scores. Other SmartBoards monitor various items including wounds, fall risk, and immunizations/vaccinations.

**Discharge/30-day Readmission:** A SmartBoard monitors discharged patients and detects readmission within the CMS 30-day window. Any readmission for a similar condition triggers an automated alert to the Director of Nursing and Case Management for follow-up and to determine what, if anything, needs to be done differently.

### Readmission Risk SmartBoard

Room/Bed	Patient Plan of Care	Attend MD Age/S/Wt	Service	T BP	P R	Readmit Risk Fall Risk Score	HCT/HGB CM Assigned	Braden Score CM Assigned	MRSA	VRE	ESBL
MSP23 1	Patient name HANNI COPD	HANNI 80/F/71.21 kg	TEL	98.2 138/78	97 18	8 45	36.5/11.2 CM.SAZ	21 CM.DJF			
MSP12 1	Patient name HANNI AFIB	HANNI 78/F/64.86 kg	TEL	98.2 112/58	90 20	8 65	35.3/11.9 CM.MH	18 CM.DJF			
MSP08 1	Patient name KOMIR WEAK	KOMIR 82/M/105.23 kg	TEL	97.7 84/58	68 20	6 30	28.1/8.8 CM.GMP	19 CM.MH			
MSP19 1	Patient name HANNI PNEUMONIA	HANNI 83/F/40.82 kg	MED	97.7 117/56	75 18	2 25	27.4/9.1 CM.DJF	15 CM.MH			
ICU7 1	Patient name SUBNA COLON	SUBNA 73/M/113.39 kg	SUR	98.2 152/80	50 20	1 35	36.9/12.0 CM.SAZ	CM.DJF			
MSP21 1	Patient name KOMIR MED	KOMIR 62/F/107.50 kg	TEL	98.6 102/61	101 20	1 25	23.4/8.0 CM.SAZ	17 CM.GMP			
MSP10 1	Patient name SINNAV SURG	SINNAV 64/F/110.04 kg	SUR	98.0 113/52	92 20	1 10	31.1/10.3 CM.DJF	21 CM.SAZ			
ICU5 1	Patient name HANNI SEPSIS	HANNI 84/M/60.78 kg	ICU	98.0 120/58	61 20	45	28.7/9.5 CM.SAZ	15 CM.DJF			
MSP05 1	Patient name KOMIR UTI	KOMIR 96/F/44.45 kg	MED	98.2 130/74	87 18	45	29.4/9.6 CM.GMP	18 CM.MH			

#### A Flexible Platform, a Great Resource

With technical help from iatricSystems, Penn Highlands Elk continues to roll out new SmartBoards, which are improving patient care and productivity. “We had great hopes for Visual SmartBoard, and it has definitely paid off,” says Mary Ann Schwabenbauer, CIO, Penn Highlands Elk. “iatricSystems has been a great, great resource for us.”