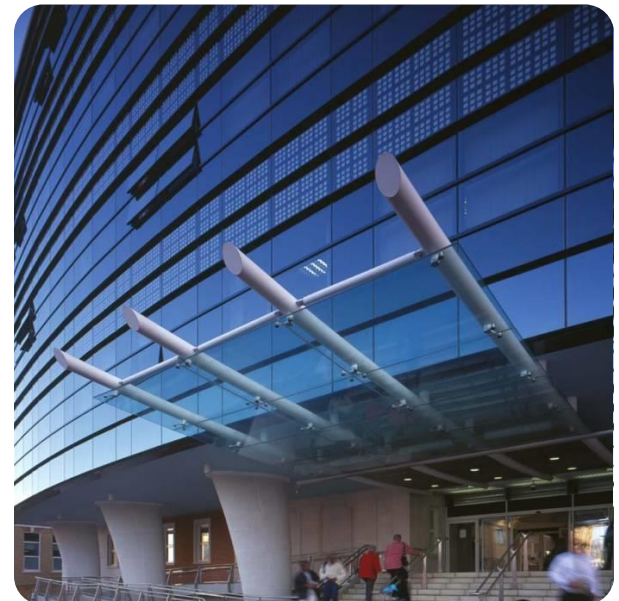


The use of technology by Nurses in delivering safe care, King's College Hospital experience....

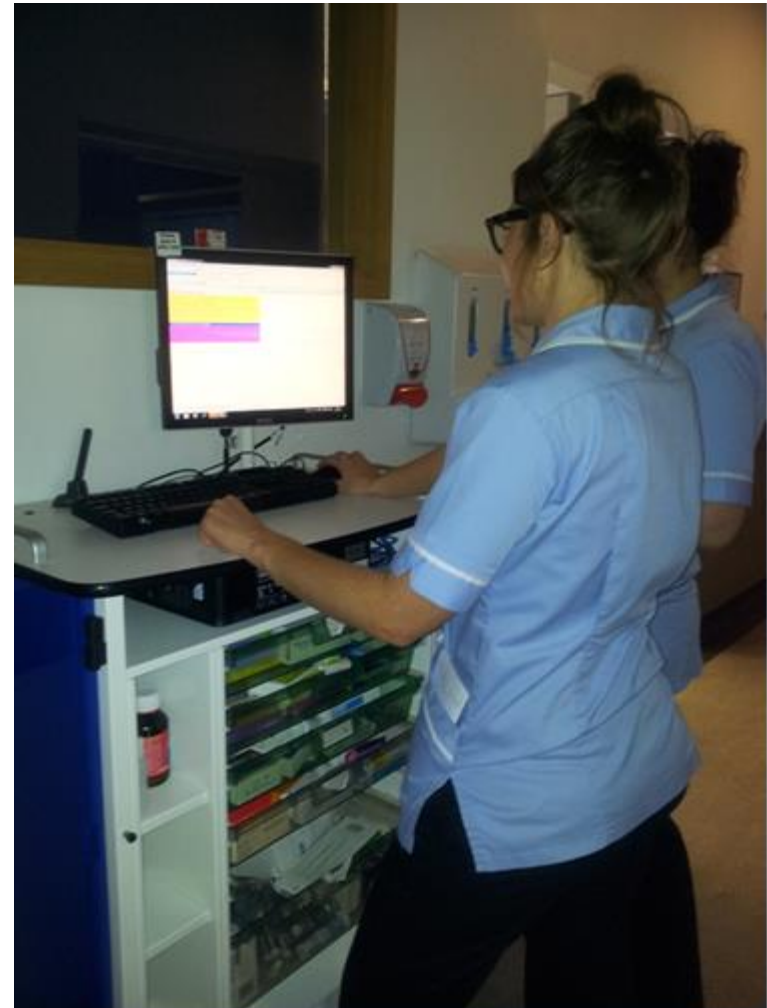
**Moira O'Toole Senior ICT Project
Manager/RN
Nursing Technology Fund Launch
Event – 10th June 2014, London**



- King's College Hospital - Denmark Hill Site
Princess Royal Bromley Hospital
Orpington Hospital
Some clinical services at Queen Mary's Hospital,
Sidcup, Beckenham Beacon and Sevenoaks Hospital
- Denmark Hill - 900 bedded acute hospital in South East London. Level one trauma centre, cardiac arrest centre and has tertiary Neuroscience, Liver, Haematology and Neonatology services

Some of the ICT applications Supporting Safer Care at King's

- Electronic Patient Record (EPR) Interfaces to imaging, pathology, includes clinical noting
- Electronic Prescribing and Medication Administration system (EPMA)
- Wardview-Patient Status Board
- Electronic Observation Chart (Wardware)



At a click (or few)

Search Results (7)

- Spine (Cervical) - MRI 08/02/2014 15:47:00 Read
- Sacrum - MRI 11/02/2014 16:08:00 Read
- Rheumatoid Factor 11/02/2014 16:17:00 Read
- Full Blood Count 11/02/2014 16:17:00 Read
- Renal/Liver/Bone/Urea 11/02/2014 16:17:00 Read
- Biochemistry (Glucose) 11/02/2014 16:17:00 Read

Acknowledgement Status

13/02/2014 07:59:15 No action

Test Name Full Blood Count
Resulted Date 11/02/2014
Requested By
Requested For
Current consultant

Numeric Result

Item Name	Value
WBC	9.69
RBC	4.72
Hb	147
PCV	0.460
MCV	98.3
MCH	31.2
MCHC	31.0

Orders

Results

Results acknowledgement

Allergy

Other - Please Specify
 DRESS with allopurinol. Patient unaware of allergy, quinine-reaction not documented.

Non-Steroidal Anti-Inflammatory Drugs
 Suffers with gastric reflux. Advised by GP not to take NSAIDs. Patient unaware of allergy.

Information Items/Currently NOT Scheduled
 VTE Assessment high risk of VTE. Low risk of bleeding.

Drug Levels (Within date range)

Drug Name	Resulted Date	Result
Coagulation INR	09/02/2014 11:00	1.41 Ratio
INR	11/02/2014 11:01	1.40 Ratio

Please note: STAT medication is now shown below the regular medication.

Regular Medication

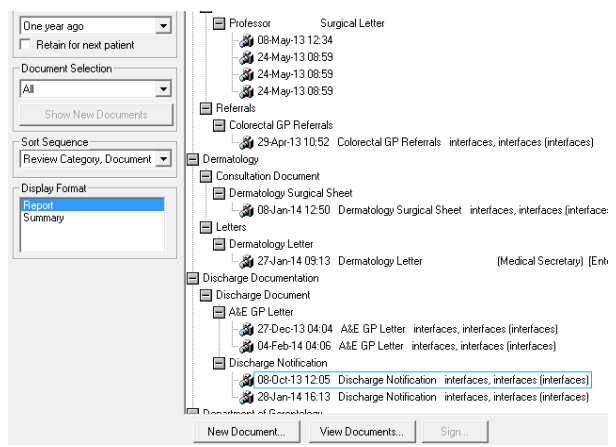
Names	Time	9/2	10/2	11/2	12/2	13/2	14/2	15/2
Amoxicillin Capsule 250 mg Oral, THREE times a day (9, 14 & 22) Indication: PUD	12	VERIFIED						
Plat 1 Sodium Lactate Compound Injection (Pharmacia solutions) 1000 mL Intravenous, over 8 Hours	14	VERIFIED						
Co-Amoxiclav 250/125 Tablet 1 Tablet Qd, THREE times a day (9, 14 & 22) Indication: PUD	14	VERIFIED						
Mensespan Injection 1 mg Intravenous, STAT, Maximum rate Single	22							
Mensespan Infusion 1 mg Intravenous, THREE times a day (9, 14 & 22), to be reviewed on 22 Feb 2014 Indication: pouda with background of myeloma	14							
Onxam Biology advice to correct hyponatremia/ hyponatremia. Dose 1000ML 0.9% Sodium Chloride, Infuse over 30 minutes. Reconstitute powder with WF (10ml per 500mg) give 50mg/mL	22							

Drug administration charts

Consultant view drug charts

Clinical Observations

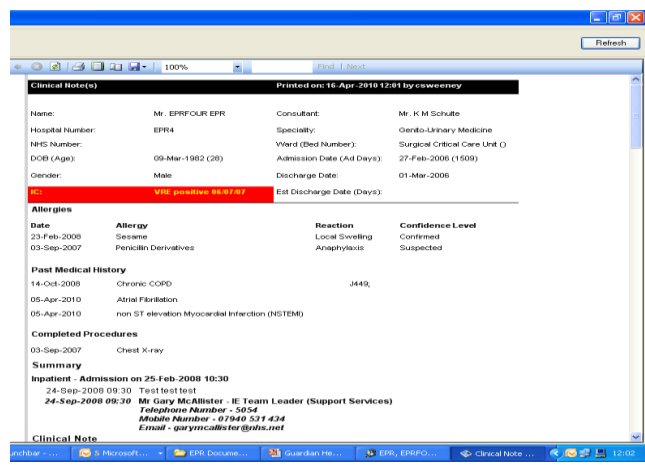
A few more clicks



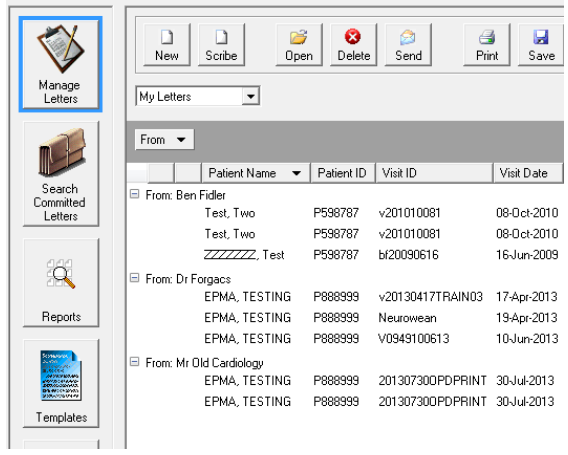
Documents (e.g. discharge notification)

	06Feb14	06Feb14	07Feb14	09Feb14	10Feb14
Observation	11:37	12:31	14:58	11:04	16:09
New Referrals	No	No	No	No	N
Diagnosis					
General					
Neurology					
Musculoskeletal					
Surgical					
Ward	Lonsdale	Lonsdale	Lonsdale	Lonsdale	Lonsdale
Wait time in working sessions (T	0	0			
Critical Care	No	No	No	No	N
Team	General Medicine	General Medicine	General Medicine	Weekend	Weekend
Reason for intervention	Liaison	Assessment, Liaison	Assessment, Liaison	Assessment, Liaison	Assessment, Liaison
Direct Patient Care Contacts	0	1	1	1	1
Total Direct Patient Care in Min		30 minute(s)	25 minute(s)	40 minute(s)	40 minute(s)
Total Indirect Patient Care in m	5 minute(s)	15 minute(s)	20 minute(s)	20 minute(s)	10 minute(s)
Discharge Status		On Review	On Review		On Review
Episode Close		No	No		N
On discharge was equipment o					
If yes, what equipment?					
Additional Comments					

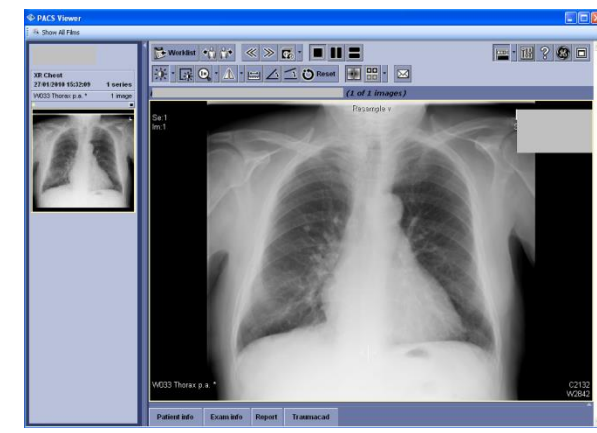
Flow sheets



Clinical Notes



Clinic letters



Images

Ward View Reports

Welcome to Lonsdale Ward																		
Bed	Day	MRSA Swab	MRSA Result	Infection Control Status	HIV Admission Screen	Days Since Last HIV Test	EPR VTE Assessments	Antibiotic Review Date	Hours since last Blood Glucose	Peripheral Venous Line (Days)	CV Line (Days)	Early Warning Score	Expected Date of Discharge	Hours since last Dr's entry in e-notes	Alcohol Screen	Urinary Catheter	Discharge Meds.	Discharge Summary Status
1	22	+	-		+	3	2					2	04 Feb 2014 (9)	25	-		+	Dispensed
2	16	+	-		+	59	1		5			1	10 Feb 2014 (3)	25	+		-	
3	3	+	-		+		1		5			1		25	-		+	In Progress
4	60	+	-		+		3					0	14 Feb 2014 (-1)	22	+	59	-	
5	28	+	-		+		2					2	14 Feb 2014 (-1)	24	-		+	Confirmed
6	20	+	-		+		2					2	21 Feb 2014 (-8)	25	+	20	-	
7	9	+	-		+	48	1		5			1	14 Feb 2014 (-1)	1	-		+	In Progress
8	7	+	-		+		1	!		2		0		1	-		+	Confirmed
9	10	+	-	!	+	89	1		28			3		21	-		+	Confirmed
10	5	+	-		+		2		5			1		24	-		-	
11	23	+	-	!	+	22	2		5				07 Feb 2014 (6)	1	-		-	
12	2	+	-		-		2					1		1	-		+	In Progress
13	1	+	-		-		2					1		19	-		-	
14	1	+	-		-		2					1	13 Feb 2014 (0)	2	+		-	

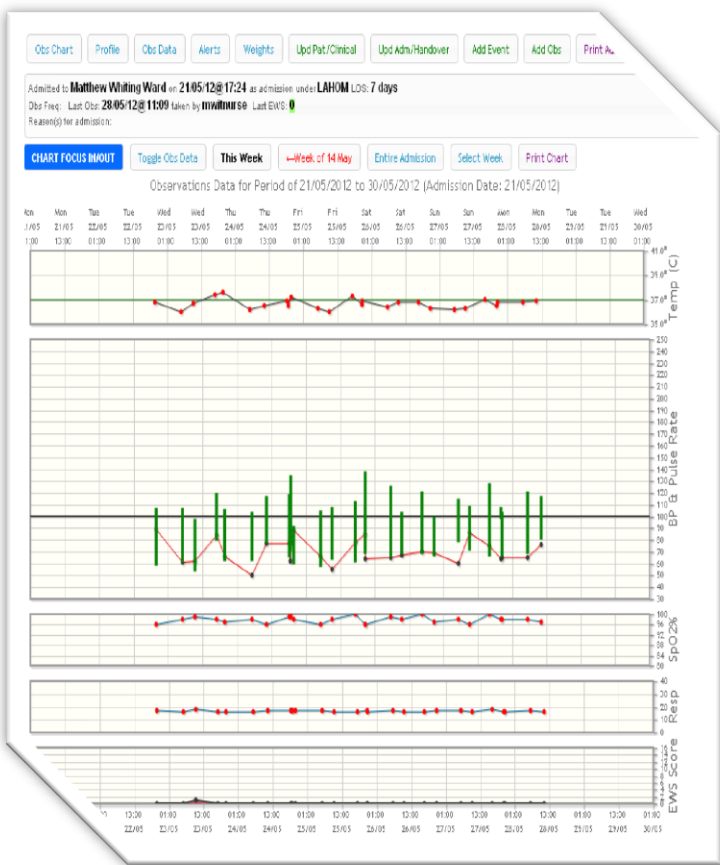
Consolidated view used during handover.

Clinical quality data, for frontline staff!

**Automated daily notification to
Ward Managers, Matrons, Consultants.**

Electronic Observations - Wardware

Wardware - provides an electronic version of the existing paper chart



Wardware

- drivers for implementation
- first piloted in 2010/11
- roll out to adult inpatient areas began 2012
- currently in use on 33 wards

Pre Electronic System Audit

- 80% of paper charts completed appropriately
- 16% Early Warning Scores calculated incorrectly
- Only 49% of triggered scores escalated + responded to correctly

Post Implementation Audit

- 100% observations with EWS correctly calculated
- 100% of predetermined trigger scores flagged
- Recording of observations within scheduled time -
 - approx. 73 % - within 30 minutes
 - approx. 76 % - within 1 hour
 - approx. 83% - within 2 hours

From this

Physiological Observation Track & Trigger System

King's College Hospital NHS Foundation Trust

Unit No: [Redacted] Consultant: [Redacted]

Name: [Redacted] DOB: [Redacted] Ward: [Redacted]

Month/Year: 11/30

Date: 20/11/2014

Time: 11:30

Temp (C): [Graph showing temperature fluctuations between 36.0 and 38.0]

Temp-Score: 0

Respiratory Rate - RR (breaths per min): [Graph showing respiratory rate between 10 and 20]

RR-Score: 0

SpO₂ (%): [Graph showing SpO₂ between 92% and 98%]

SpO₂ Score: 0

O₂ Flow: 2L

PR value: [Graph showing pulse rate between 70 and 100]

Blood Pressure (mmHg): [Graph showing blood pressure between 100/60 and 140/90]

SBP-Score: 0

PR-Score: 0

Urine Rate (ml per hr): [Graph showing urine output between 10 and 30 ml/hr]

Urine Score: 0

Bladder Y/N: [Checked]

Blood Sugar: [Checked]

Responsiveness-Score: 0

Bowels: 0

Weight: 0

Pain-Score: 0

TOTAL EWS: 0

INITIALS: [Handwritten initials]

Countersignature: [Handwritten signature]

MPFS Score: 0

SpO₂ score:
 99-100% 1
 91-92% 1
 93-94% 1
 95-100% 0

There are other important primary observations on the reverse side.

To this

Richard TESTER P588967 51 M dob 10/02/1962

- Chart
- Profile
- EWS Obs
- All Obs
- Alerts
- Adms Hx
- Fluids
- Devices
- GCS
- O2
- Weights
- Edit
- Flag

Adm Matthew Whiting Ward on 01/05/13@00:00 LOS 6 d Obs Freq: 30 mins Last EWS 8 at taken by motoole Reason(s):

- ZOOM In/Out
- Toggle Obs
- Toggle O2
- week
- day
- Latest Obs
- Select start date
- Print Chart
- This Adm Only

EWS Observations Data for Period 30/04/2013 through 08/05/2013

POTTS codes 0 2-3 4-6 8 Pain scores 0-3 4-6 7-8 9-10 U

Date	2013									2013	
	Wed	Thu	Thu	Fri	Fri	Sat	Sat	Sun	Sun	Mon	Tue
	01:05	01:05	01:05	01:05	01:05	01:05	01:05	01:05	01:05	02:05	07:05
Time	13:25	13:25	13:25	13:25	13:25	13:25	13:25	13:25	16:03	12:28	11:11
EWS	4	4	4	4	4	4	4	4	8		8
Temp	37.4	37.4	37.4	37.4	37.4	37.4	37.4	37.4	39.2	37.0	39.0
Resp	16	16	16	16	16	16	16	16			
SpO2	93	93	93	93	93	93	93	93	88		86
On O2?	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Pulse	110	110	110	110	110	110	110	110	120		120
Syst BP	97	97	97	97	97	97	97	97	120	120	100
Diast BP	60	60	60	60	60	60	60	60	80	80	60
Response Score	0	0	0	0	0	0	0	0	0		0
Pain Score	0	0	0	0	0	0	0	0	0		0

Observations for Period of 30/04/2013 to 08/05/2013 (11 Obs)



Wardboard

DONE Wardboard

Alerts

Obs

Lists ▾

Admin ▾

ishannon

Help

Logout

TRAINING/NHS No/Surnam

Print Handover Report

Toggle Next Obs

Update Ward Notes

Ward Info/Users

"Ward Round"

13 Current DONE Bed Assignments (LOS=length of stay on DONE; Adm Dates in yellow="Temporary/Manual")

Options	Code	Bed	patient	Sex	Age	Consult	Admitted	LOS	EWS	Obs Freq	MRSA?	Isol?	Reason for Admission (first 60 chars)
Upd Chart	DONE	Bed 1	TEST, Crazy	M	41		Wed 22/01	105	2	2 hourly			bleeding
Upd Chart	DONE	Bed 2	TESTORE, Rosalea	F	34		Wed 16/10	203	3	2 hourly			
Upd Chart	DONE	Bed 3	TEST, Epr Live	M	34		Mon 06/01	121	2	2 hourly			diabetes
Upd Chart	DONE	Bed 4	TEST, Baby	M	6		Mon 06/01	121	1	6 hourly			chest pain
Upd Chart	DONE	Bed 5	TESTER, Veronica Anne	F	72		Wed 29/01	98	0	6 hourly			
Upd Chart	DONE	Bed 5	TEST, Graham	M	58		Wed 22/01	105	1	6 hourly			
Upd Chart	DONE	Bed 6	TEST, Aau Patient Flow	F	44		Mon 06/01	121	2	2 hourly			bleeding
Upd Chart	DONE	Bed 7	TEST, Martin	M	47		Wed 23/10	196	6	30 mins			
Upd Chart	DONE	Bed 8	TEST, Aau Patient Flow	F	44		Tue 25/02	71	0	6 hourly			chest pain
Upd Chart	DONE	Bed 9	TEST, Apas	M	12		Mon 14/04	23	6	30 mins			liver transplant assessment
Upd Chart	DONE	Bed 10	TEST, Incident Incident Number	M	63		Fri 24/01	103	0	6 hourly			Elective TKR
Upd Chart	DONE	Bed 13	TEST, New Number		44		Mon 06/01	121	0	6 hourly			chest pain
Upd Chart	DONE	Bed 14	TEST, Allan	M	114		Mon 06/01	121	3	2 hourly			abdo pain

Clerking Queue

No patients requiring clerking found.

Alert Screen

DONE Wardboard

Alerts

Obs

Lists ▾

Admin ▾

ishannon

Help

Logout

TRAINING/NHS No/Surnam

Donne Inpatient Alerts

9 Recent DONE alerts Threshold: EWS>0 Displayed; Most Recent at Top. Use Alert Logs to view and search a complete list of alerts.

Options	Obs Date Time ▾	Patient	Ward	Sex	Age	EWS	Trend	Observer	Responder	Response
View	2014-04-14 14:18:00	Test, Apas	DONE	M	12	6		ishannon	ishannon	2014-04-14 14:51:09 (33 mins): SHO bleeped (zc)
View	2014-04-14 04:23:00	Test, Baby	DONE	M	6	1		ishannon	ishannon	2014-04-14 14:52:33 (629 mins): no action obs to be rechecked in 1 hr ()
View	2014-02-12 11:51:00	Testore, Rosalea	DONE	F	34	3	2	jchudley	ishannon	2014-04-14 13:16:37 (87925 mins): ACKNOWLEDGED
View	2014-02-05 11:05:00	Test, Graham	DONE	M	58	1	0	jchudley	jchudley	2014-02-11 15:04:15 (8879 mins): ACKNOWLEDGED
View	2014-02-05 10:40:00	Test, Crazy	DONE	M	41	2		jchudley	jchudley	2014-02-05 11:32:51 (52 mins): ACKNOWLEDGED
View	2014-01-29 12:04:00	Test, Allan	DONE	M	114	3	1	jchudley	jchudley	2014-02-04 10:45:29 (8561 mins): ACKNOWLEDGED
View	2014-01-29 11:42:00	Test, Martin	DONE	M	47	6	5	jchudley	ishannon	2014-04-14 13:17:26 (108095 mins): blp 333 (ss)
View	2014-01-27 11:22:00	Test, Epr Live	DONE	M	34	2	-2	jchudley	ishannon	2014-05-07 11:16:14 (143994 mins): ACKNOWLEDGED
View	2014-01-23 13:46:00	Test, Aau Patient Flow	DONE	F	44	2	-9	itrain	itrain	2014-01-24 12:20:24 (1354 mins): ACKNOWLEDGED

🔔 You can change the "Alert Threshold" in the Ward Info tab.

Key Themes

- No observations recorded for long periods
- No recognition of deterioration/no action
- EWS calculated incorrectly
- Limited access of paper based system
- Delay in receiving prompt medical attention

Benefits

- Observations due are flagged ✓
- Prompts - abnormalities flagged, escalation protocol flagged ✓
- System automatically calculates EWS ✓
- Observations immediately accessible electronically ✓
- Data readily available for audit ✓
- TBC?

Challenges to implementation

- Organisation Culture
- Organisation size and geographical location
- Engagement
- ICT Infra-structure
- Resistance to change
- Legacy systems
- Resources – financial and staff

Organisational Vision

- The ICT Department is committed to “making progress towards a safer, faster, paperless hospital across all sites”
- Alignment with overall strategy to improve care, outcomes and experience for our patients
- Engagement and leadership from Board, Senior Management and front line Clinical staff

Collaboration between Clinical and IT staff

- ICT Nurse Reference Group
- Enthusiastic Clinical Director for ICT
- Involvement of users
- Recruitment of Clinical staff
 - Clinical Systems and Project Teams
- Review of clinical processes
- Understanding the practical use of system in the clinical area
- Benefits of the system clearly understood by the Clinical team
- Ownership and empowerment of clinical users

- Define the scope!
- Plan, monitor issues, mitigate & risks
- Identify resources
- Clarity– roles and responsibilities
- Benefits tracking
- Change control
- Problem escalation
- Business Continuity

- Know your user
- Training resources
- Train the Trainer/ Key Users
- Analysis
- Go live support
- Monitoring, feedback, review

We are excited about the future!

Continued implementation

- Remaining adult wards at Denmark Hill site
- Obstetrics
- Paediatrics
- Across all KCH sites

Enhanced Functionality

- National Early Warning Score –v2.0
- Weight Entry & BMI Calculation – v2.0
- Fluid Balance Charts – v2.0
- Device Management – v2.0
- Gastro-intestinal/Stools Observations – v2.0
- Patient Risk Assessment– v2.0
- Reports and audit
- Support for identifying Sepsis

Diabetic Foot care

- 3D imaging of wounds
- Interface to PiMS/PAS & EPR
- Long term to roll to further nursing specialists such as Tissue Viability Nurses

Electronic Vital Signs & Risk Assessments

- Mobile Devices , tablet size, bar code readers for positive patient identification
- Device for every nurse on every shift across organisation
- Improved Mobile Device Management

- Nurses represent the largest workforce within health care systems
- They spend more time with patients than any other health care practitioners
- Therefore play a curial role in implementing and achieving meaningful use of technology

(McBride, et al 2012)

THANK YOU