

# Getting it right, every time.

Better patient monitoring and fewer cardiac arrests at Croydon University Hospital

## Introduction

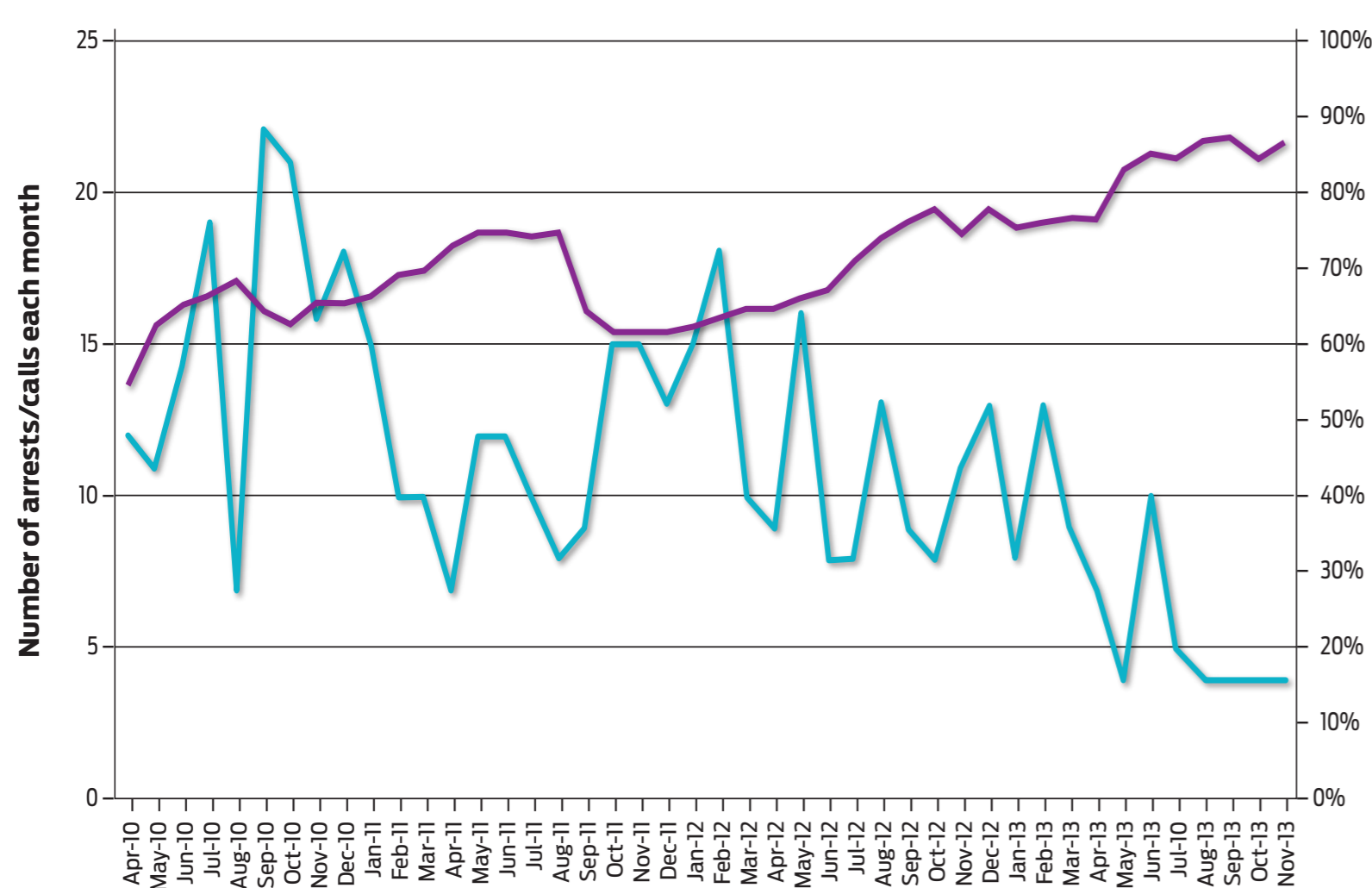
Croydon University Hospital provides healthcare to 360,000 people in South London. Historically, patients were poorly monitored, especially at night. The trust had six serious incidents over 12 months where patient deterioration had not been recognised.

Nationally, the NPSA and NCEPOD have reported similar findings (1-4). 70% of patients who have a cardiac arrest in hospital have documented signs of deterioration beforehand and 62% may have been preventable (5). Poor management of deterioration is a major cause of the estimated 12,000 avoidable deaths in English hospitals each year (6).

## Objectives & methods

From June 2010 the Trust introduced VitalPAC across all 18 adult general wards. VitalPAC enables clinicians to record patient data on iPod touches, calculates the National Early Warning Score (NEWS) and advises on next steps including when to escalate care. It facilitates early proactive intervention by specialists because patient data can be viewed anywhere and by anyone with access to the hospital intranet (7).

To drive compliance, the trust developed a deteriorating patient care bundle. Results were posted on every ward, showing numbers of late and night-time observations, patient escalations and unexpected admissions to intensive care (figure 2).



Graph 1: Cardiac arrests vs obs on time

## Results & outcomes

Data from VitalPAC were extracted to calculate the total number of observations taken per day, at night (defined as midnight to 6am) and on time (recommended interval plus at least 30 minutes). The Trust's cardiac arrest database provided details of cardiac arrest calls on inpatient wards.

Improvements were immediate:

- Mean observations/patient increased from <3 to >4/pt/day
- Completeness of observations were sustained at >99%.
- Observations taken on time increased from 55% to 85%.
- Night-time observations increased from 40% of expected to 100%.
- Unplanned admissions to ICU decreased by 54%.
- Cardiac arrests decreased by 70%, equivalent to 120 fewer per year (graph 1)

Figure 1: VitalPAC device & screen shot

## Deteriorating Patient Care Bundle

Ward	W3	W2	P3	H1	Q3	W1	Q1	Q2	P1	P2	H2	F2	F1	E2	D1	D2	AMU
Lateness of obs (hrs)	01:20	02:20	01:50	01:34	01:19	01:21	02:04	00:46	00:51	01:49	01:09	00:53	01:13	03:10	02:08	01:39	01:44
Nighttime obs	64%	88%	44%	64%	84%	80%	100%	68%	100%	64%	96%	76%	76%	72%	92%	80%	84%
NEWS escalation above 7	04:04	01:02	01:02	01:02			02:02	03:03	00:01		01:01	05:05	06:06	04:04	02:02		05:07
Cardiac arrests with no prior NEWS escalation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ITU admissions not escalated	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Compliant	no	no	no	no	yes	yes	no	no	yes	no	yes	yes	yes	no	no	yes	no

### Observations at night

Ward	Nov 2012		Dec 2012		Jan 2013				
	18-24	25-1	2-8	24-30	31-6	7-13	14-20	21-27	28-3
AMU	68%	52%	60%	72%	56%	68%	60%	76%	84%
JW3	64%	84%	84%	80%	92%	44%	92%	84%	64%
JW2	100%	88%	100%	88%	92%	84%	88%	80%	88%
JW1	72%	64%	64%	68%	76%	80%	72%	80%	80%
JQ3	46%	88%	80%	72%	56%	76%	76%	92%	84%
JQ2	76%	76%	60%	72%	80%	72%	76%	80%	68%
JQ1	100%	100%	92%	96%	88%	92%	100%	100%	100%
JP3	84%	52%	72%	44%	88%	60%	56%	68%	44%
JP2	68%	72%	68%	68%	68%	60%	60%	64%	64%
JP1	72%	80%	68%	60%	60%	96%	92%	88%	100%
JH2	88%	84%	88%	92%	84%	84%	88%	100%	96%
JH1	68%	84%	92%	80%	72%	80%	72%	88%	64%
F2	80%	76%	76%	76%	84%	80%	72%	64%	76%
F1	84%	80%	72%	88%	80%	80%	76%	88%	76%
E2	68%	44%	68%	64%	72%	68%	60%	56%	72%
D2	68%	76%	64%	80%	76%	76%	80%	84%	80%
D1	68%	80%	96%	64%	60%	76%	84%	80%	92%

### Lateness of observations

Ward	Nov 2012		Dec 2012		Jan 2013				
	18-24	25-1	2-8	24-30	31-6	7-13	14-20	21-27	28-3
AMU	01:44	01:42	01:39	01:47	01:43	01:55	01:50	01:54	01:44
JW3	01:22	01:48	01:47	01:50	01:45	02:40	01:28	01:34	01:20
JW2	01:43	01:45	01:10	01:32	01:30	01:44	01:15	02:09	01:21
JW1	02:00	02:03	01:36	01:23	02:44	02:09	01:37	01:12	01:21
JQ3	01:46	01:57	01:35	01:29	01:56	01:42	01:37	01:31	01:19
JQ2	01:40	01:27	01:04	01:26	01:04	01:22	01:31	01:11	00:46
JQ1	01:21	01:41	01:40	01:23	01:30	01:43	01:36	01:38	02:04
JP3	02:01	01:52	02:12	01:10	01:41	01:37	02:00	01:40	01:50
JP2	01:48	02:09	01:48	02:06	01:35	01:37	01:29	01:30	01:49
JP1	01:05	00:58	01:02	01:05	01:12	01:09	00:45	00:47	00:51
JH2	01:23	01:30	01:22	01:39	01:22	01:16	01:03	01:37	01:09
JH1	01:25	01:39	01:27	01:12	01:21	01:03	01:19	01:31	01:34
F2	01:12	01:08	01:11	01:16	01:10	00:55	00:51	01:06	00:53
F1	01:00	01:03	00:53	01:11	01:14	01:37	01:01	00:52	01:13
E2	01:33	01:35	01:50	01:26	01:45	01:44	02:01	03:16	
D2	01:04	01:35	01:08	02:13	02:32	01:36	01:00	01:18	01:39
D1	02:07	01:57	01:46	00:44	01:44	01:55	01:48	01:30	02:06

Figure 2: Weekly ward performance dashboard

## Discussion

The fundamentals of care must be in place before patients can receive consistently high quality and safe care. Although it is possible to improve routine ward activities for short periods through the use of audit and "time and motion" studies, these are short lived interventions that measure only a small proportion of the care provided and their effect is often diluted in the longer term.

Electronic systems offer the opportunity to reinforce hospital protocols every time a clinician uses them. They can provide real-time information to clinicians and managers, enabling rapid feedback on performance and the opportunity to nip problems in the bud, before patients suffer harm.

## Conclusions

- Better patient monitoring enables earlier identification of deterioration before serious consequences develop.
- It is possible to drive high compliance with protocols if staff have the right tools and motivation.
- Electronic systems that enable this must be designed around the user needs, and be always available at the bedside when needed. They must be accurate, reliable and secure and their use needs senior Executive level support.
- Clinicians need regular feedback on performance. Injecting a dose of competition often helps foster better care.

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