

Improving the frequency of visual infusion phlebitis (VIP) scoring on an oncology ward

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Abstract

Phlebitis from peripheral intravenous infusions is an important potential source of oncology patient morbidity. Important factors found to determine phlebitis incidence include the kind of infusion and dwell time of intravenous cannula. Early studies showed incidence rates of between 25-70% worldwide, and association with up to 10% of *S. aureus* bacteraemia. The introduction of the visual infusion phlebitis (VIP) score tool for assessment of the early signs of phlebitis, along with prompt removal of peripheral intravenous cannulas, has been very successful in reducing the incidence below the acceptable rate of 5%. However, achieving this goal depends on strict compliance with guidelines for cannula insertion, documentation, and assessment using the VIP tool.

This study aimed to increase the use of VIP scoring tool to 100% on an oncology ward during a four to six month period in order to maximise its utility in phlebitis prevention. Three plan-do-study-act (PDSA) cycles were carried out, during which two major interventions were introduced. The first cycle aimed to improve junior doctors' awareness of VIP scoring using presentations in induction meetings and posters. The second cycle ensured that ready access to the VIP tool was provided in the form of bedside intentional rounding charts. Proportions of intravenous cannulas with proper documentation and VIP assessment were measured before intervention and at nine subsequent bi-weekly time points.

Pre-intervention, under 30% of cannulas were properly documented and assessed. This proportion rose to around 80% by the end of the second PDSA cycle and achieved 100% by the end of the third cycle.

Problem

Peripheral venous catheters (PVCs), such as those routinely inserted in busy oncology units all over the UK, can cause infections ranging from local phlebitis to cellulitis to severe sepsis. Data regarding the frequency of phlebitis or cellulitis related to PVCs are not routinely collected. However, data concerning patients with *Staphylococcus aureus* bacteraemia is collected by infection control practitioners in our hospital, who investigate all cases and assess relationship to PVCs. An incident of 11% is estimated in the wider community of UK hospitals that are considered to be the same as in Castle Hill Hospital (phlebitis induced by cannulas is estimated between at 25-75% in different studies).

The introduction of the visual infusion phlebitis (VIP) score tool for assessment of early signs of phlebitis, and prompt removal of peripheral intravenous cannulas, has been very successful in reducing the incidence below the acceptable rate of 5%. However, achieving this goal depends on strict compliance with guidelines for cannula insertion, documentation and assessment using the VIP tool.

Background

Healthcare workers insert peripheral intravenous (PIV) catheters every day into the majority of patients who are admitted to an acute

care facility. It is estimated that 150 million PIV catheters are inserted annually in the United States, with an increasing use of medication therapy that is toxic to the veins. Early studies found that 25%-70% of all the patients receiving PIV therapy developed infusion-related phlebitis, defined as the inflammation of a vein, with an acceptable rate of phlebitis at 5%.^[5] Infusion-related phlebitis may develop while the intravenous catheter is in situ and up to 96 hours after the intravenous catheter is removed.

Conclusive comparison of PIV phlebitis rates as measured by visual assessment of the PIV site is dependent on the usage of a valid and reliable phlebitis scale. The visual infusion phlebitis (VIP) scale, a modified version of the original Maddox scale^[15], was developed to numerically rate phlebitis based on observable symptoms.^[16] This scale recommends a specific action for each numeric rating. Standardized use of this scale can eliminate dwell time as the predominant variable for changing peripheral PIV sites.

Baseline measurement

The visual infusion phlebitis documentation has been reviewed for the 21 patients in the ward. A VIP was deemed incorrect when either the date of the insertion, the name of the inserter, the number of attempts, the date due to be reviewed, or the VIP score at baseline was not correctly documented. Pre-intervention, under 30% of cannulas were properly documented and assessed, as you can see in the run-chart.

See supplementary file: ds3668.pdf - "Pre- intervention measurements"

Design

We understood that the main problem was that the doctors were unaware of the VIP chart and/or where to find it in the trust documents.

For that reason, we raised the awareness of all doctors in the team by providing a teaching session in the morning handover and by further explaining the place where the charts could be easily accessed. We also placed a poster in the handover room in order to act as a continuous reminder to all junior doctors.

Strategy

Three plan-do-study-act (PDSA) cycles were carried out, during which two major interventions were introduced. The first was designed to improve junior doctors' awareness of VIP scoring using presentations in induction meetings and posters (PDSA cycles 1 and 2). The second ensured that ready access to the VIP tool was provided in the form of bedside intentional rounding charts (PDSA cycle 3). Proportions of intravenous cannulas with proper documentation and VIP assessment were measured before intervention and at nine subsequent bi-weekly time points.

Results

After each PDSA cycle we checked what proportion of cannulas had the correct VIP documentation (date, VIP score, name, flushed, number of attempts, and date to be reviewed).

The proportion has increased from 28% (baseline) up to 85% after six weeks, but then had fallen down to 60%. Another teaching session was then organized for the new members of the team. The proportion raised again up to 90% and subsequently fallen to 80%. The proportion reached the target of 100% only when the PDSA cycle 3 was introduced. This gave access to the VIP chart simply by placing it at the end of the bed. The run-chart and table of results are attached.

See supplementary file: ds3671.pdf - "QIP results table and runcharts"

Lessons and limitations

The study was not without limitations. It was conducted with one group of patients, primarily oncology patients, in only one unit of one large hospital. This particular unit is mainly staffed by experienced nurses, and inexperienced nurses generally find an experienced nurse to start a PIV catheter if there is any question of access. The number of changes in dressing per site, which could affect mechanical phlebitis rates, was not recorded. However, dressings are changed infrequently. Introducing a change is not difficult when proper awareness is provided, and relatively small

interventions can often achieve relevant results.

Conclusion

Applying the intervention was an extremely positive action as it has significantly improved VIP assessment. The number of incorrect VIP evaluations decreased, meaning that patients were receiving safer care, with the risk of phlebitis being safely reduced to less than 5%.

What is clear is that in a busy environment such as a hospital, workers need to be aware that the systems they work in are in need of constant refinement to optimise working conditions and minimise the potential for harm. The introduction of the VIP score at the end of the bed has clearly had a significantly beneficial effect, but should not make individuals complacent. There is always a need to refine and optimise systems and this project has demonstrated just that.

References

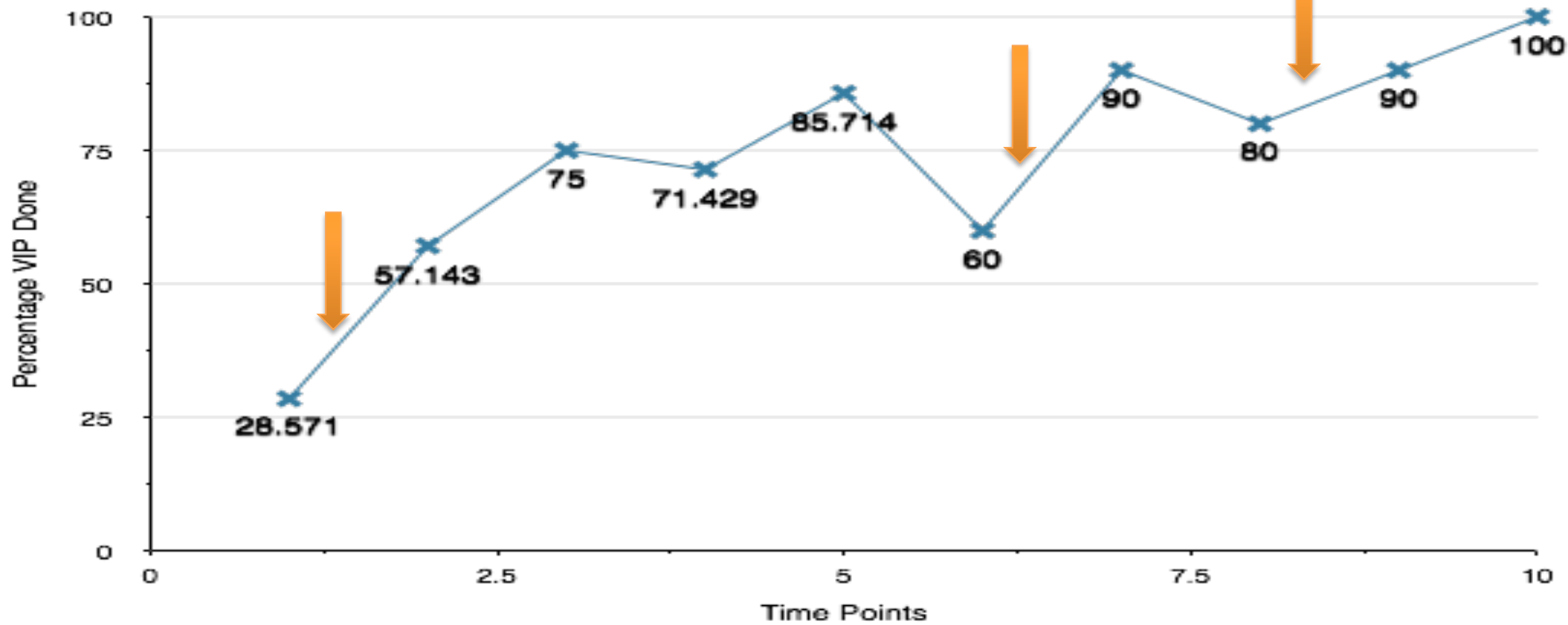
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Declaration of interests

Nothing to declare.

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Time Point	Day	Date		No. of Cannulas	VIP DOne	Doctor's Cannulas	Doctor's VIP	Nurses Cannulas	Nurse's VIP	% VIP Done	%VIP Done Doctors	%VIP Done Nurses	VIP Reviewed	% VIP Reviewed	Cannula Dated
1	0	7/10/13	7/10/13	10	4	7	2	3	2	40	28.5714285714	66.6666666666	4	40	4
2	7	14/10/13	7/10/13	14	9	7	4	7	5	64.2857142857	57.1428571428	71.4285714285	9	64.2857142857	9
3	16	23/10/13	7/10/13	13	10	8	6	5	4	76.9230769230	75	80	10	76.9230769230	10
4	21	28/10/13	7/10/13	12	10	7	5	5	5	83.3333333333	71.4285714285	100	10	83.3333333333	10
5	28	4/11/13	7/10/13	13	12	7	6	6	6	92.3076923076	85.7142857142	100	12	92.3076923076	12
6	34	10/11/13	7/10/13	11	9	5	3	5	5	81.8181818181	60	100	10	90.9090909090	8
7	70	16/12/13	7/10/13	15	13	10	9	5	4	86.6666666666	90	80	15	100	14
8	77	23/12/13	7/10/13	11	9	5	4	6	5	81.8181818181	80	83.3333333333	11	100	15
9	91	6/1/14	7/10/13	18	16	10	9	8	7	88.8888888888	90	87.5	13	72.2222222222	13
10	117	1/2/14	7/10/13	14	14	10	10	4	4	100	100	100	12	85.7142857142	10

