A new approach to training in intravenous drug therapy

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A multidisciplinary team organised an intravenous infusion training day for nurses on the preceptorship programme at Chesterfield and North Derbyshire Royal Hospital. Theoretical and practical sessions were set up to provide instruction and supervision of safe practice principles for an activity that is widely acknowledged as being a source of risk. The results of the training day showed that more than 90 per cent of the participants evaluated the experience positively and this helped to improve both their competence and confidence in the procedures involved.

The administration of intravenous drug therapy is one of the many challenging skills that have to be mastered during the preceptorship period, not only by newly qualified nurses but also by those who are returning to nursing after a career break.

At Chesterfield and North Derbyshire Royal Hospital the preceptorship programme is well established. It is specifically designed to identify training needs through clinical experience, anecdotal evidence and risk management processes, and to remain flexible in order to address these needs.

Theory of preceptorship

The NMC advocates that all newly registered nurses and midwives and those returning to clinical practice should receive a period of support in order to help them achieve the confidence and competence that is required of a registered practitioner.

The supported period of preceptorship is no less than four months and is not expected to exceed six months. Although the NMC recognises that preceptorship is not a mandatory requirement it is strongly advocated as sound professional practice (NMC, 2002).

Implementation of programme

In March 2000, the Chesterfield and North Derbyshire NHS Trust recognised the need to develop preceptorship on a corporate basis in order to ensure that all newly qualified practitioners receive equal access to this support.

In the past three years approximately 150 newly registered and returning nurses and midwives have accessed the trust’s programme.

The course is designed to ensure a smooth transition from student to registered nurse, allowing individuals to adjust to their new role by increasing their clinical and professional skills and knowledge at an appropriate stage of the preceptorship period. The aim of the programme is to achieve this in two ways. First to deliver a skills and knowledge-based programme within a classroom setting over a six-month period. Second to address the emotional and psychological impact of the transition from student to newly qualified practitioner.

On the first day of the preceptorship programme participants are asked about their fears and expectations.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Very Good</th>
<th>Excellent</th>
<th>Comment only</th>
<th>Did not attend</th>
<th>No score or comment</th>
<th>Total number taking part</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1 Continuous infusion</td>
<td>9 (34.5%)</td>
<td>16 (61.5%)</td>
<td>1 (4%)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Scenario 2 Blood transfusion</td>
<td>4</td>
<td>21 (15%)</td>
<td>1 (80%)</td>
<td>4 (4%)</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>Scenario 3a Frusemide</td>
<td>3 (23%)</td>
<td>4 (31%)</td>
<td>5 (38%)</td>
<td>1 (8%)</td>
<td>13</td>
<td></td>
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<td>13</td>
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<tr>
<td>Scenario 3b Insulin sliding scale</td>
<td>2 (13%)</td>
<td>5 (33%)</td>
<td>7 (47%)</td>
<td>1 (7%)</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td>15</td>
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<tr>
<td>Scenario 4 Bolus injection</td>
<td>8 (31%)</td>
<td>17 (65%)</td>
<td>1 (4%)</td>
<td></td>
<td></td>
<td></td>
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<td>26</td>
</tr>
</tbody>
</table>
BOX 1. LEARNING POINTS IN IV THERAPY

Four scenarios were used to test participants’ skills and knowledge about the main aspects of intravenous therapy administration. Each involved a set of learning skills.

Continuous infusions (crystalloids, colloids)
The learning points associated with continuous infusions are as follows:
- The importance of checking the cannula for patency and signs of infection;
- The use of the cannula assessment tool and clear documentation in the event of a problem;
- The procedure for checking the prescription, fluid, patient identity and safe preparation of the infusion and infusion device.

Blood products
The learning points associated with blood products are as follows:
- The importance of checking that the patient understands that a blood transfusion is required and the process involved;
- Identifying the correct procedure for blood collection and the mandatory checks required prior to the administration of blood products;
- The observations required while the transfusion is in progress and what to do in the event of a transfusion.

Intermittent infusions
Two different intermittent infusions were used, frusemide and insulin.
The learning points associated with frusemide are as follows:
- The importance of an appropriate infusion device to ensure that the drug is delivered as per the prescription;
- Demonstrating calculations to ensure that the drug is delivered at the required dose or rate;
- An appreciation of the maximum dose and possible side-effects of frusemide.
Learning points for insulin administration include those for frusemide as listed above, plus the following:
- The discussion of the management of hypoglycaemia and hyperglycaemia;
- The discussion of relevant practice guidelines.

Bolus injections (antibiotics)
The learning points associated with bolus injections of antibiotics are as follows:
- The importance of reconstituting an antibiotic in accordance with the hospital guidelines produced by the pharmacy;
- Cannula assessment;
- Patency check;
- Use of a postadministration flush.

about becoming qualified members of staff. In addition to concerns regarding socialisation to the ward, they expressed anxieties about their accountability and responsibility relating to clinical aspects of care such as drug administration.

Intravenous infusion therapy session
An annual review of the preceptorship programme has provided an ideal opportunity to consider different ways of delivering the intravenous infusion therapy session and to address issues such as support and supervision for clinical staff and newly qualified staff.

At the original training session those attending received a preceptor drug administration pack. This contained a review of professional responsibility, trust policy and drug calculations, which was delivered by a senior pharmacist. The pharmacist provided information on relevant drug calculation techniques, followed by two concurrent workshops: self-directed ‘spot the error’ and supervised ‘reconstitution’.

The student was then allocated a preceptor on the ward who observed, supervised and signed off a range of intravenous administration techniques in the teaching pack. This section of the programme did not run smoothly, as there were difficulties observing and documenting the appropriate number of intravenous administrations. In response to these difficulties and the desire to reinforce best practice, the decision was made to expand the four-hour session to a full day using scenarios and workstations.

Study day
The study day was intended to enable those taking part to complete the first assessment of competence in each of the required intravenous administration sections, provide a start to the process and alleviate some of the pressure from the preceptors in the clinical area.

The completion of assessments in an environment free of clinical distractions also aimed to offer a valuable opportunity to review theory and practice in the context of local policies and procedures.

Method
Four groups rotated through four workstations, each consisting of two scenarios.

These covered the main aspects of intravenous therapy frequently encountered by the participants in their roles, namely continuous infusions, blood products, intermittent infusions and bolus injections. The facilitator assessed practical skills and theoretical knowledge for each scenario.

The workstations also provided a valuable opportunity to reinforce general principles of infection control such as handwashing, appropriate disposal of sharps and waste, documentation and relevant clinical guidelines, in addition to specific learning points.

Before starting on the practical scenarios, participants were asked to read a description of the therapy they were required to prepare and select the appropriate

REFERENCES


Completion of the study day

After completing the activities included in the study day participants are required to continue supervised intravenous administrations in the clinical area to ensure competence before undertaking independent practice.

Information regarding their progress and any specific concerns about their theoretical knowledge and/or practical competence is discussed with the ward managers by the clinical education advisers and practice development advisers so that further supervision in clinical practice can be arranged as necessary.

Results

Overall, participants and facilitators evaluated the day positively. Of the 29 evaluations, 26 were returned and the results were overwhelmingly positive. The evaluation was designed to provide an opportunity to score and comment on the individual scenarios. The scores were on a scale of 1 to 5, with 1 indicating ‘poor’ and 5 ‘excellent’.

Table 1 and Figs 1 and 2 provide a breakdown of the results by scenario and overall organisation of the study day and on the pharmacist session. Feedback was very positive, with the vast majority of participants rating the scenarios as good, very good or excellent (Table 1). This ranged from 92 per cent to 96 per cent over the four scenarios, none of which received a poor or fair rating.

The most positively rated was the blood transfusion scenario, which 80 per cent of respondents rated as excellent and 15 per cent as very good; the bolus injection scenario received a rating of excellent from 65 per cent of those taking part.

The organisation of the day was rated as good, very good or excellent by 61 per cent of those who responded (Fig 1); 27 per cent provided comments only and 12 per cent did not score or provide any comments on the organisational aspects of the day. Regarding overall organisation, 23 of the 26 participants commented on the support that had been provided and the interactive nature of the day. Participants also commented on how the study day had improved their knowledge of and confidence in using the equipment and provided them with the opportunity to demonstrate the process without being afraid of any problems occurring.

The least highly rated scenarios (3a and 3b) were the intermittent infusion scenarios. These required participants to set up for either the frusemide or insulin sliding scale intermittent infusion. Feedback from this workstation demonstrated the need to redesign the programme to ensure that participants had access to both scenarios, as they are equally important and are both encountered in general practice.

Although the evaluations were overwhelmingly positive, respondents raised a number of points by adding constructive comments to their evaluation forms; the facilitators who had made observations throughout the day also highlighted a number of issues.

Future programmes

Points to consider for future programmes include the long day (9am to 4.45pm with a working lunch), waiting time between scenarios, group size and reorganisation of the initial session – including ‘spot the error’ and ‘reconstitution’ – to ensure that all participants are involved.

FURTHER READING


with an activity. In addition to these points it was felt that the workstations should include copies of clinical guidelines and care plans to reinforce the importance of checking information and procedures and accurate contemporaneous documentation.

**Discussion**

The administration of intravenous therapy is an area of practice that has developed and grown significantly over the past 20 years with the increased use of sophisticated medical devices to deliver multi-drug regimens and replace large volumes of fluid.

Although technological advances have revolutionised treatment they have also resulted in increased risk associated with the preparation, administration and use of medical devices for intravenous therapy.

The Medicines and Health Care products Regulatory Agency (formerly the Medical Devices Agency and the Medicines Control Agency) identifies a significant number of adverse incidents related to infusion devices that are not caused by so-called user error (Medical Devices Agency, 1995).

The NHS Litigation Authority (2002) acknowledges the clinical risk, specifying in Standard 5 of the **Clinical Risk Management Standards** that ‘staff who operate diagnostic or therapeutic equipment are formally trained to do so safely and effectively’.

Learning from experience to improve clinical care and enhance patient safety is a key element of clinical governance (NHS Litigation Authority, 2002; Dowsett, 2001), as is staff education to ensure that practitioners are both knowledgeable and skilled.

Supervision in the clinical setting is essential for nurses to develop the necessary knowledge, skills and understanding. Although it is recognised that clinical staff are in a position to initiate and demonstrate good practice (Ioannides, 1999), anecdotal evidence suggests that staff face major difficulties in supervising and supporting students and newly qualified staff due to lack of time and the pressures of work.

Understanding the realities of practice and being informed of drug-related incidents has enabled the clinical education advisers to influence the redesign of intravenous therapy training on the preceptorship programme. Areas of potential risk and knowledge gained from previous incidents have informed the development of relevant scenarios to be used by the multidisciplinary team over the course of the day.

The delivery of training for a day in a non-clinical area has several advantages that include:

- Confronting issues surrounding support and supervision. The process of supervision is started on the day that staff have access to senior practitioners who have time to answer questions and provide support;
- Providing participants with predictable learning opportunities, with scenarios tailored to the specific learning outcomes;
- Offering learning opportunities in a safe environment in which mistakes provide valuable learning opportunities away from the distractions of the clinical area;
- Providing the opportunity to re-test participants’ competence with infusion devices and build on their existing equipment training (credentialisation);
- Testing competence on an individual basis using scenarios that require setting up prescribed infusion regimens. Instruction can be provided without unnerving the patient or the nurse;
- Using questionnaires with each scenario provides an opportunity to assess knowledge and identify deficits;
- The chance to document concerns in the competency booklet and feed these back to both the ward manager and the preceptor.

**Conclusion**

The preceptorship programme at Chesterfield and North Derbyshire Royal Hospital NHS Trust demonstrates a responsiveness to the educational needs of newly qualified or returning nurses and aspects of risk management identified by the trust.

The importance and relevance of this approach was demonstrated by the overwhelmingly positive response from those who participated. They valued the opportunity to practise drug calculations, reconstitute drugs and assemble equipment in an environment free of clinical distractions.

The facilitators were unanimous in their agreement that the day provided an important foundation for the continuing supervision and assessment undertaken by staff in clinical practice.

The resources required for the training are not insignificant in terms of staff and equipment. However, the training must be viewed as an investment in future practice, care delivery, risk management and a continuing commitment to multidisciplinary working practices.