Open Lower-Limb Fracture Performance
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Description of Project
The ortho-plastics group at University Hospitals Coventry & Warwickshire NHS Trust (UHCW) is a multidisciplinary collaboration between the departments of Emergency Medicine, Anaesthesia, Plastic Surgery and Trauma & Orthopaedic surgery with the aim of improving the management and outcomes of patients presenting to our major trauma centre with open lower limb fractures.

The impact of a dedicated Ortho-Plastics operating list on time to soft tissue coverage of open lower limb fractures

Problem
In 2012-13 our trauma centre fell short of the national average for the treatment of open lower limb fractures (BOAST4). This quality improvement project describes how we utilised TARN data to implement a change that transformed our unit from one of the poorest performing centres, to one of the top performers. We describe how this process has not only resulted in a significant improvement in our service but how the increased collaboration between specialties has resulted in a number of additional improvements.

Background
Open fractures are particularly devastating injuries since the rates of infection can be as high as 50%.1 One of the major factors affecting outcome is the timing with which definitive soft tissue coverage is performed. This is reflected in the BOAST4 standards, which set a target of providing definitive soft tissue coverage within 72 hours of injury.

Baseline Measurement
Our open fracture caseload in 2011-12 was significantly lower than the national average in the management of open fractures. We compared a baseline audit of TARN data to establish where we stood with our current standard of care. This highlighted a gap between the guidelines present a particular challenge to our centre. This revealed that in Q1 and Q2 of 2013 we were unable to provide definitive soft tissue coverage within 72 hours of injury for any of our patients presenting with an open fracture.

Design & Patient Involvement
Our quality improvement intervention consisted of establishing a multidisciplinary working group centred around a dedicated once weekly combined specialty operating list. This is a fully staffed whole day operating list dedicated to the management of open fractures with allocated senior plastic and orthopaedic surgeon presence built into the job plans of participating consultants. This is supported by scheduled multidisciplinary team meetings and joint follow-up clinics. The success of these interventions has led to the commissioning of an additional weekly operating session such that there are now two dedicated operating sessions per week for surgery on open fractures.

Our unit has been listening to the views and experiences of patients sustaining an open lower limb fracture for some time as part of the UK Wound management of Open Lower Limb Fractures (UK WOLFF) trial.2 Interviews with this patient group identified the importance of “information” and an “early definitive management plan”. This involves early joint ortho-plastics management; a feature which has greatly influenced the development of this service.

Strategy and Results
Our quality improvement project went through a number of Plan-Do-Study-Act (PDSA) cycles as follows:

PDSA Cycle 1: Initial Audit to identify the causes of poor compliance with BOAST 4. We identified that providing soft tissue coverage was the main problem (in Q1/Q2 2013 none of our open fractures achieved this standard). We hypothesised that this was due to availability of senior plastic and orthopaedic surgeons and dedicated theatre time.

PDSA Cycle 2: We introduced a dedicated weekly ortho-plastics operating list for an initial test period of 6-months after which we re-examined the TARN data. We found that our ability to provide definitive soft tissue coverage improved to 20-30% (see Figure 1).

PDSA Cycle 3: The improvements observed justified the implementation of the weekly ortho-plastics list and a business case was put forward to develop the service. This involved the appointment of an additional plastic surgery consultant with an interest in open fractures, with an interest in open fractures. This is reflected in the BOAST4 standards, which set a target of providing definitive soft tissue coverage within 72 hours of injury.

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Descriptive Analysis
We have collected and analysed data from the TARN database. This has been compared to the national average and local targets to assess the performance of the service. The data has been presented in a number of ways, including graphs and tables, to provide a clear and comprehensive overview of the service's performance.

We have also performed additional analysis to identify areas for improvement. This includes looking at specific patient groups, such as those with major trauma or complex injuries, to see if they are being treated differently to the national average. We have also looked at the impact of the interventions we have made, such as the introduction of a dedicated ortho-plastics operating list, on the outcome of patients with open lower limb fractures.

In conclusion, we have demonstrated that our service has significantly improved since the implementation of the weekly ortho-plastics operating list. The improvements have been made possible through a multidisciplinary approach involving orthopaedics, plastics, and emergency medicine. The continued focus on improving the service will ensure that patients with open lower limb fractures receive the best possible care.