Abstracts of the Cambridge University Plastic, Reconstructive and Aesthetic Surgery Society Conference

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Application of Lean Methodologies in Plastic Surgery: A Systematic Review

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ABSTRACT

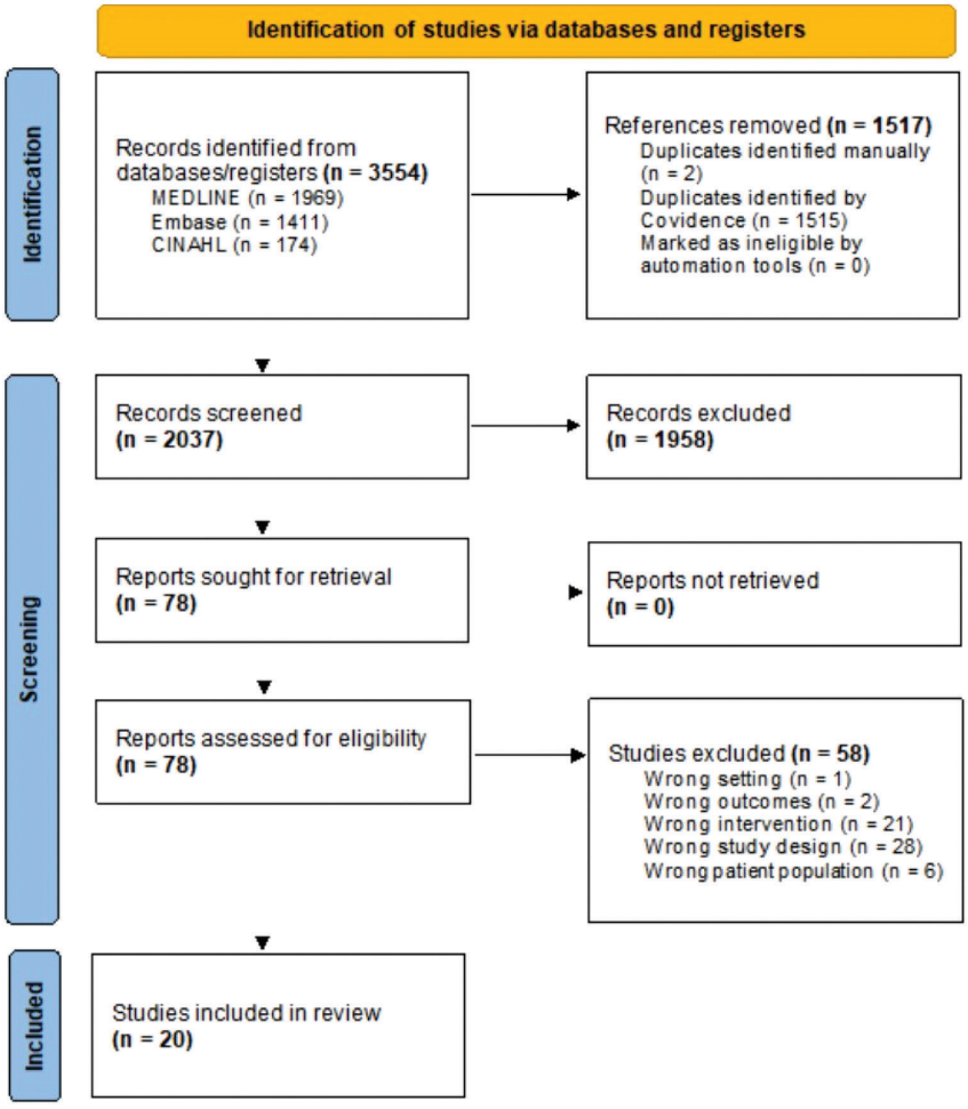
Introduction: Lean management (LM) is a set of principles first developed by Toyota in the 1950s aimed at optimising efficiency and reducing waste in production systems. This paper aims to systematically review whether LM has improved efficiency and reduced waste in Plastic Surgery.

Methods: Four databases were searched for studies from January 2008 to October 2023 using LM in Plastic Surgery departments. The review included prospective, retrospective, and comparative studies in English. Data were extracted in duplicate and checked by a third reviewer. Given the heterogeneity of outcomes, measures of effect as reported in the studies were used for comparison.

Results: Of the 2037 articles identified, 19 met the inclusion criteria, comprising a total of 3208 patients with an average study duration of 24 months. Most studies were prospective (n = 15, 79%) and US-based (n = 12, 63%). All studies showed improvement in their outcomes, including reduced time spent in theatre (n = 6, 32%), cost savings (n = 5, 26%), reduced hospital length of stay (n = 5, 26%), and patient and staff satisfaction (n = 4, 21%). Morbidity and mortality remained unchanged in a majority of studies (n = 4, 21%).

Conclusion: Surgery is one of the main contributors to the carbon footprint of the NHS, and the need to improve our sustainability and patient flow is essential given worsening service pressures and climate change. LM, by streamlining processes and reducing waste, provides an effective framework to spur efficiency and improve patient and staff satisfaction in plastic surgery.

Adaptability to different programs needs to be considered before successful implementation.



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Mohs Surgery for Dermatofibrosarcoma Protuberans: Should It be the Gold Standard or the Only Option?

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ABSTRACT

Introduction: Dermatofibrosarcoma protuberans (DFSP) is an uncommon soft tissue malignancy occurring mostly in the trunk and proximal extremities. Finger-like growths that extend away from the macroscopic margins of the tumour result in local aggression and high rates of recurrence. Thus, it can be challenging to ensure oncological clearance without radical excision margins. This poses the risk of significant, disproportional defects. Mohs micrographic surgery (MMS) involves staged marginal excision and horizontal sectioning of specimens, allowing

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more precise mapping of incomplete margins and targeted subsequent clearance, resulting in the preservation of surrounding tissue.

Methods: We reviewed cases of histologically reported DFSP between 2017 and 2024 in a single tertiary centre and illustrated three cases where MMS was employed in different ways to optimise patient outcomes.

Results: Surgical sites included the scalp, hand, and inferior quadrant of the breast.

Case 1: Due to the potential extent of the resection on a young man's scalp, MMS was used to histologically map the extent of the tumour's margins before the excision of the central component.
Case 2: MMS was used for histological clearance of a DFSP to the hand due to the significant potential functional morbidity associated with radical excision. Reconstruction was with a pedicled groin flap.
Case 3: MMS for a DSFP to the inferior quadrant of the breast in a female patient. Reconstruction was with a pedicled thoracodorsal artery perforator flap.

The mean DFSP size was 4.06 cm^2 (range 0.48–7.75 cm^2), and the mean defect size was 63.9 cm^2 (range 11.25–129.7 cm^2). The median number of Mohs procedures was 2 (range 1–5). No recurrence was observed over a median follow-up period of 70.7 months (range 3–88 months).

Conclusion: Principles of MMS can be implemented to ensure oncological clearance of DFSP but in various ways as illustrated. Reconstruction can then be tailored to the resultant defect.

Analysis of Operative Efficiency in Deep Inferior Epigastric Perforator Flap Reconstruction

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ABSTRACT

Introduction: We sought to analyse operative efficiency in our Plastic Surgery department for deep inferior epigastric perforator (DIEP) flap surgery in order to identify areas for improvement. Operative efficiency has several aims: reducing waste, minimising intra-operative mistakes, better post-operative outcomes for patients, and improving patient and staff satisfaction.

Methods: All patients who underwent unilateral and bilateral DIEP flap procedures between September and October 2023 in our department had operation notes, inpatient notes, and discharge summaries reviewed. Data collected included time sent for, knife-to-skin (KTS) time, operation length, intra-operative complications, hospital length of stay (LOS), and post-operative complications. Results were tabulated and scatter graphs were created using Excel to identify correlations between KTS, operation length, and hospital LOS.

Results: Nineteen patients underwent DIEP procedures. The average time sent for was 8:29 am, with a 9:04 am anaesthetic start time. KTS time averaged 10:07 am. The mean operation length was 449 minutes, and mean hospital LOS was 5.85 days. Only two procedures (11%) had intra-operative complications. There was no correlation on the graphs between KTS time and operation length or hospital LOS. Overall, 42 hours of operative time were wasted during the study period.

Conclusion: Service pressure within the NHS continues to grow, as does our responsibility to work sustainably. Given that DIEP procedures are long and technically challenging, improving operative efficiency can have numerous and substantial benefits for the patient and team. This study is ongoing as we use these results to focus on optimising the KTS time using an MDT approach.

Medical Student Collective Action in the Last Decade: A Five-Country Study

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ABSTRACT

Introduction: Medical student collective action represents organised resistance by future healthcare professionals to influence healthcare policy, educational reform, and social justice issues.

Method: A comparative case study approach was employed, analysing documented instances of medical student collective action in the United States, the United Kingdom, Nigeria, South Korea, and India.

Results: In the US, medical students engaged in the 2014 "White Coat Die-Ins" to support the Black Lives Matter movement, spurring curriculum reforms to address racial health disparities. Medical students in the UK aligned with the BMA during recent resident doctor strikes and during the 2015 #NotFairNotSafe protests, advocating against unsafe contracts and working conditions for junior doctors. In Nigeria, campaigns targeted brain drain, advocating for better retention policies, and protested against delayed stipend payments and educational disruptions. In South Korea, medical students are currently boycotting universities, delaying their graduation and entry into the workforce, in protest of increased medical school quotas. Students in India regularly protested bond service requirements and educational policies, emphasising educational quality, workplace safety, and fair compensation.

Discussion: Medical student collective action takes diverse forms, including university boycotts, social media campaigns, public demonstrations, and policy advocacy. These actions often align with broader professional resistance movements and achieve the greatest impact when coordinated with practising physicians.

Successful initiatives have led to policy changes, improved conditions for students, curriculum reforms emphasising equity, and increased public awareness of healthcare issues. However, these actions may delay student graduation, disrupt workforce planning, and indirectly affect patient care. Future medical education must balance activism with healthcare delivery, recognise medical students as key stakeholders in health system reform, promote social justice initiatives, and prioritise preventive dialogue with student bodies to mitigate disruptions.

Conclusion: Medical student activism is a potent force for systemic change in healthcare and education, underscoring the importance of engaging students in policy discussions.

Does Implant Reconstruction Increase Risk of Complications and Potentially Worsen Survival? A Study of Patients Treated at the Royal Free Hospital

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ABSTRACT

Introduction: While it seems logical that some patients might prefer to have breast reconstruction after a mastectomy, there is no randomised evidence regarding its benefits or its oncologic safety. Growing evidence suggests

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that surgical complications increase the risk of cancer relapse. We assessed the risk of complications after mastectomy with or without reconstruction.

Methods: We retrospectively analysed patients treated at RFH from three specific months from 2017 to 2022. We assessed predictors for surgical complications: age, diabetes mellitus, smoking, heart disease, and neoadjuvant chemotherapy. We assessed the risk of breast, donor, and wound complications and the number of hospital visits. Statistical software 'STATA' and Excel were used to analyse the data, and x^2 test.

Results: Serious wound complications (delayed healing, skin necrosis, wound breakdown, explantation) occurred in 1 out of 52 patients (2%) who had mastectomy without reconstruction versus 8 out of 23 (35%) who had implant reconstruction.

This higher rate of complication was despite the lower incidence of diabetes, smoking, and heart disease in the reconstruction cohort.

	Mastectomy (52)	Mx + reconstruction (23)
Age (mean + SD)	60 ± 16	47 ± 12
Diabetes (%)	6/52	0/23
Smoking (%)	7/52	3/23
Heart disease (%)	7/52	2/23

SD: standard deviation.

Conclusion: Complication rates were about 17 times higher when implant reconstruction was performed after mastectomy despite having patients in a better state of health. It could jeopardise their breast cancer disease-free survival, which will be assessed in the near future in a larger cohort.

Right-Sided Lateralisation of Basal Cell Carcinoma and Squamous Cell Carcinoma in a UK Cohort

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ABSTRACT

Introduction: US[1] and German[2] studies have found higher prevalence of left-sided sun-exposure-related skin cancers than the right, attributed to left-sided driving. To our knowledge, no UK studies have investigated this association.

The aim was to determine whether basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) show an asymmetrical distribution (right, left, or midline) in a UK cohort.

Methods: Records of patients with biopsy-confirmed BCC or SCC at Addenbrookes Hospital in 2018–2019 were reviewed (5153 BCC, 1728 SCC patients). Patients with lesions located in the face/scalp regions were included. Lesions were classified as right, left, or midline. Differences in lesion prevalence were assessed using the Chi-squared test.

Results: There were 3535 facial/scalp BCCs and 979 facial/scalp SCCs in 2018–2019. Most prevalent BCC locations were nose, cheeks, and temples. For SCCs, the scalp, cheeks, and ears were the most prevalent sites.

For BCCs, significant right-midline-left differences were observed across all years ($p < 0.001$). Among non-midline BCCs, significantly more right-sided BCCs were observed in 2018 and 2018/19 (in 2018–2019: 52.4% right, 47.6% left, $p = 0.01$).

For SCCs, significant right-midline-left differences were found across all years ($p < 0.001$). Among non-midline SCCs, there were more right-sided SCCs, but this did not reach statistical significance (53.3% right, 46.7% left in 2018–2019, $p = 0.056$).

Subgroup analysis for the 2018–2019 data found that among BCCs of males, there were more right-sided lesions (53.6% right, $p = 0.003$). Right-sided predominance was also observed within SCC of females (61.8% right, $p = 0.001$). Other subgroups that showed significant right-sided predominance include patients aged ≥60 with BCCs ($p = 0.023$), forehead BCCs ($p = 0.030$), and nose SCCs ($p = 0.049$). Mouth BCCs showed left-sided predominance ($p = 0.039$).

Conclusion: Significant right–left differences were observed for BCCs and several subgroups in this UK cohort, supporting the association between driving UV exposure and skin cancer risk. Similar laterality was observed in SCCs but did not achieve statistical significance, possibly due to the smaller sample size (Table 1).

Table 1 | Number of Facial/Scalp BCC and SCC in 2018 and 2019 by Side

Lesion type	Year	Side of lesion			Total number of lesions	p-value of Chi-square test comparing right, left, and midline	p-value of Chi-square test comparing right and left
		Right	Left	Midline			
BCC	2018	803	713	316	1832	<0.001*	0.021*
	2019	720	672	311	1703	<0.001*	0.198
	2018–2019	1523	1385	627	3535	<0.001*	0.010*
SCC	2018	212	194	78	484	<0.001*	0.372
	2019	228	191	76	495	<0.001*	0.071
	2018–2019	440	385	154	979	<0.001*	0.056

Asterisks mark statistical significance: *p < 0.05.

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Surgical Management of Plexiform Fibrohistiocytic Tumour Using the Slow Mohs Approach

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ABSTRACT

Introduction: Plexiform fibrohistiocytic tumours (PFHT) are rare mesenchymal neoplasms of the dermal and subcutaneous tissue with low-to-intermediate-grade malignancy. They chiefly present as small, slow-growing, asymptomatic nodules or indurated flat plaques on the upper extremities of children, adolescents, and young adults. Histologically, PFHTs are characterised by a combination of fibroblast-like and histiocyte-like cells in a plexiform pattern.

In previous literature, wide local excision has been the conventional treatment for PFHT. However, PFHT has a high recurrence rate, reported to be between 12.5% and 37.5%, and often presents with ill-defined clinical boundaries, making it difficult to achieve clear histological margins before reconstruction. The slow Mohs technique is an alternative effective approach that allows for precise margin control during excision, minimising the risk of residual tumour whilst preserving surrounding healthy tissue.

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Here, we describe two patients who presented with biopsy-proven PFHT. We discuss the histopathological features and the surgical treatment using the slow Mohs technique.

Methods: A retrospective electronic chart review identified two PFHT cases from the hospital's histopathology database. Clinical data was analysed using the hospital electronic patient record system (EPIC®).

Results: Case 1, a 37-year-old female, presented with an indurated flat plaque in the left groin. Histological analysis confirmed it to be a myofibroblastic variant of PFHT, and it was excised using a single-stage slow Mohs procedure. Case 2, a 26-year-old male, presented with a small, asymptomatic, firm nodule on the left upper arm. Again, the slow Mohs technique was used to ensure a clear margin, requiring two Mohs layers. The surgical defects were closed directly, without the need for complex reconstruction. Both patients' recoveries were uneventful. Follow-up at 3 years 10 months for Case 1 and 1 year 3 months for Case 2 showed no recurrence.

Conclusion: These cases demonstrate the effective use of the slow Mohs technique for achieving complete histological clearance of PFHT, with no recurrences observed to date. Our findings add to the growing evidence base supporting slow Mohs as a valuable surgical option for the management of PFHT.

Keywords: Plexiform fibrohistiocytic tumour, Slow Mohs surgery

Virtual Reality with Haptic Feedback Improves Outcomes in Orthopaedic Training: A Systematic Review and Meta Analysis

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ABSTRACT

Introduction: Virtual reality (VR) has become an increasingly popular tool for surgical training, but its lack of haptic feedback remains a limitation. While reviews have examined VR haptics in laparoscopy simulations, none, to our knowledge, have focused on orthopedics. This study evaluates the effectiveness of VR haptic feedback in improving training outcomes compared to other methods.

Methods: A systematic literature search was conducted through March 2024 in MEDLINE, Embase, CENTRAL, Scopus, and WoS using keywords related to haptics, orthopedics, and surgical training. Randomized controlled trials (RCTs) comparing haptic VR training to other or no training methods were included.

Results: Eight RCTs with 213 participants were included. Four studies compared haptic VR to non-haptic VR, one to no training, and three to conventional training. Outcomes assessed included error scores, operating time, and face validity. Six RCTs showed significant error reduction with haptic VR. Two studies reported better realism with haptic VR than non-haptic VR. A meta-analysis of three studies demonstrated that haptic VR significantly reduced errors compared to non-haptic VR (mean difference = −1.98; 95% CI = −3.17 to −0.78). However, two studies found that haptic VR increased operating times, and one reported a preference for bench-top simulators over haptic VR.

Conclusion: Haptic VR appears superior to other training modalities in reducing errors in orthopedic training but faces challenges with realism compared to conventional methods. Further research is needed to explore the cost-benefit ratio, the influence of fidelity on training outcomes, and its utility at different training stages.