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Review

Exploiting opportunities for leadership development of surgeons within the operating theatre

Amna Suliman [a,*], Robert E. Klaber [b], Oliver J. Warren [a,c]

[a] Department of Surgery and Cancer, Imperial College Healthcare NHS Trust, Praed Street, London, England W2 1NY, UK
[b] Department of Paediatrics and Child Health, Imperial College Healthcare NHS Trust, London, Praed Street, London, England W2 1NY, UK
[c] Centre for Patient Safety and Service Quality, Imperial College London, Praed Street, London, England W2 1NY, UK

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ABSTRACT

It is increasingly recognised that leadership skills are a key requirement in being successful in surgery, regardless of speciality and at all levels of experience and seniority. Where the emphasis was previously on technical ability, knowledge and diagnostic acumen, we now know that non-technical skills such as communication and leadership contribute significantly to patient safety, experience and outcomes, and should be valued.

The operating theatre is a unique micro-environment which is often busier, noisier, more stressful and more physically demanding than the clinic or ward setting. As a result surgeons and their trainers, who are striving to develop leadership skills require an in-depth awareness of the challenges in this environment and the opportunities that arise from them to develop leadership effectively. This article outlines why leadership learning is so beneficial in the operating theatre, both for the team and the patient as well as what elements of daily routine activity such as the WHO checklist use, list-planning and audit can be exploited to transform the average busy operating theatre into a rich, learning environment for future leaders in surgery.

1. Introduction

For a surgeon, technical ability was traditionally regarded as the only important skill in the operating theatre. However, with the growing realisation that other attributes, such as being a good team-worker and leading effectively, improve quality of care, this focus has begun to shift. Increasingly, studies show that non-technical skills therefore have a positive impact on patient safety and outcomes.[1,2]

Effective leadership in the unique environment of the operating theatre can be challenging, given its propensity for noise and stress.[3,4] We appreciate that an effective strategy is in fact the transference of leadership seamlessly between members of the theatre team during an operation as appropriate for each stage of a patient's care.[5] However our aim is to suggest ways in which specifically surgeons can feel confident in their role as leaders when the situation necessitates it, and to ensuring that their contributions are of the utmost quality. We believe that this requires surgeons to begin developing skills in leadership from an early career stage, and using daily opportunities in the operating theatre to practise, re-evaluate and improve their own leadership behaviour as well as helping to developing those around them.

We will therefore explore the importance of developing leadership skills within the operating theatre, the learning opportunities available, and the benefits of doing so such as improving efficiency of operating lists and personal relationships within the team. We then suggest ways to pursue both individual and team development, through simulation training, maximising the WHO checklist and even becoming involved in managing/redesigning services in and around the operating theatre. The increasing appreciation of leadership also provides exciting new opportunities for research and analysis of both it's effect on the team and most importantly on the patient experience and outcomes.

2. What is leadership?

When leaders are at their best, they exhibit distinct practices that vary little from profession to profession, community to community, and country to country.[6] Regardless of the organizational setting in which it is practiced, leadership is therefore, an understandable and universal process. Traditionally, leading has been considered as an external activity; i.e. someone takes charge,

* Corresponding author. Tel.: +44 (0) 7764491893; fax: +44 (0) 207 8575846.
E-mail address: suliman.amna@gmail.com (A. Suliman).

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has a vision and drives or influences the 'followers' towards it.[7] As summarised in Fig. 1 this can be done via a number of different approaches or models, each of which can be adapted to the individual leader, and situation at hand. Whist this outward aspect of leadership is critical to organizational success, leadership also involves an inward journey that raises several fundamental questions: What is my purpose? What do I care about deeply?[8,9] In this light, leadership development is therefore best understood as a continuous process of self-discovery and self-development.[10]

3. What are the traits and skills required for surgical leadership?

Surgical leadership requires all of the universal skills of a leader already mentioned, and so its development requires self-study, education, training, and experience.[11] In this setting however, additional facets such as service redesign, healthcare improvement, effective negotiation, working collaboratively and networking may also be required.[12] A leader in surgery needs to balance many different competing interests and priorities as well as managing themselves effectively. These qualities or 'habits' have been outlined in more detail in Fig. 2 and provide a framework for effective leadership which can be successfully adopted in the operating theatre environment. We feel a key attribute is ensuring the highest quality of patient care through transparency in one's own clinical practise via regular audit and service evaluation. In this way one also retains peer credibility and confidence. Surgical leaders must also hold, voice and enact strong personal values and beliefs that impact positively on those around them and place not the priorities of the provider, but those of the patient, at the centre of decision-making.[13]

4. Why do we need to develop leadership skills in the operating theatre?

Surgery is a rapidly evolving speciality with constant innovation in techniques, technologies and approaches to delivering care. The operating theatre has changed significantly in recent years and this changeable environment presents certain challenges,[14] therefore those who lead within it must be flexible, open-minded and progressive.[15] The age old debate about whether or not leaders are born or made has been exhausted; like any skill, be it operatic singing or serving in tennis, some are more naturally gifted, some are more comfortable doing it, but everyone needs coaching, development and time committed to improvement.[16,17] We should not therefore expect leadership skills to be naturally inbuilt in surgeons, nurses and anaesthetists, be they senior or trainees.

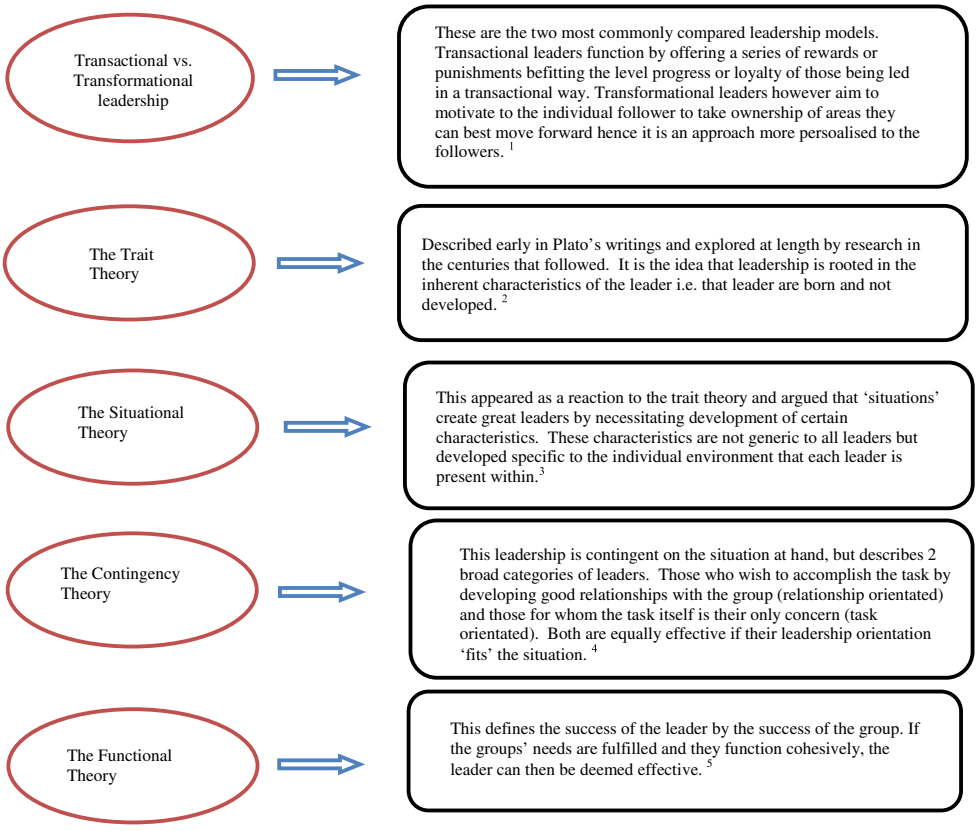

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Fig. 1. Key leadership models and styles.

Habit 1: Bravery and Resilience	Resilience and resoluteness are essential qualities as emerging leaders often face resistance in their departments when attempting to implement changes to long - standing services and practise.
Habit 2: Mentoring	Formalised mentoring enhances leadership skills and provides a way of encouraging trainees to take an active role in leading from an early stage
Habit 3: Having a vision	Whether a personal or group vision, inspiring an driving others towards a goal is essential to leadership
Habit 4: Optimism	Leaders should ensure that optimism thrives in their department and promote enthusiasm and positivity in place of the often seen cynicism and scepticism seen in surgery
Habit 5: Developing networks	Leadership is often cited as a lonely experience and developing networks with others improves the experience as well as efficiency in achieving a goal.
Habit 6: Clinical credibility	Whilst effective leadership requires a set of skills, behaviours and values, at its heart must be drive and desire for clinical excellence in one's field.
Habit 7: Recognition of Opportunity	Lateral thinking and the ability to derive new opportunities from potential enables leaders to drive their teams towards new possibilities.

Fig. 2. The seven habits of emerging medical leaders. Warren O, Stanton E. Leadership: Seven habits of emerging medical leaders. Health Serv J. 2012 Mar 22; 122(6299):28–30.

Through persistent input from an early stage, leadership skills can be successfully developed.[18]

The case for developing leadership in the operating theatre can be based upon the following four factors:

1. **Patient Safety and Quality of Care**: Wherever improvements or innovations are found in healthcare and patient safety, it is on the background of effective clinical leadership.[19] Equally when patients are harmed, as exposed by the inquiries into paediatric cardiac surgery at Bristol Royal Infirmary,[20] or patient care at Mid Staffordshire Hospital Foundation Trust[21] an absence of clinical leadership is frequently cited as a key contributor. Patient safety is therefore a key reason for leadership to be valued within the operating theatre. Around one-in-ten patients experience an adverse event during their hospital stay[22] and in surgery these mistakes, such as 'wrong site surgery', can be catastrophic, causing irreversible harm.[23] Information transfer in the operating room fails in as many as 30% of communication exchanges.[24] Examples such as prostatectomies being carried out on the wrong patients and a myringotomy being done in a child scheduled for an adenoidectomy,[25] highlight the need for improving not only leadership, but a range of non-technical skills, such as communication and ability to work with others in the operating theatre.
2. **A Supportive Work Environment:** Effective leaders can inspire and enthuse others, and leadership in the operating theatre is no exception. Conversely, negative experiences in theatre, perhaps where communication breaks down or there is discordance can take a psychological toll on all involved. A study of American surgeons showed that one-in-sixteen had suicidal ideation, the main cause of which was emotional exhaustion.[26] Developing the emotional intelligence to incorporate and value the ideas of team members, can help reduce stress in this environment. Training surgeons to be collaborative leaders who interact respectfully with their juniors and other staff, is key to flattening traditional hierarchies and building trust within which teams can function at their best. In this way, creating a positive 'emotional climate' in theatre, is therefore of benefit to the wellbeing of staff, as well as patients.[27]
3. **More efficient use of resources**: Successfully managing resources (both human and economic) are important leadership competencies. The worsening financial constraints on healthcare, caused by both economic downturn and healthcare inflation being persistently higher than standard inflation, have created an increasing need for doctors to feel as comfortable with financial accountability as they do with clinical decisions. Although many surgeons feel uncomfortable with the idea of considering costs when operating, they are responsible for spending significant sums of money, particularly in choosing grafts, prostheses, or certain equipment. By choosing an expensive option, without measurable benefit to the individual, surgeons may inadvertently impact on the availability of resources to a wider population of patients.[28] Surgeons who have invested in developing leadership skills are therefore a great asset to their department and wider organisation and can drive financial efficiency and progress.
4. **Shaping the local environment and influencing healthcare decisions**: Surgeons at all levels of seniority should be contributing to improvements in the quality of service within their speciality; as well as the immediate environment of the operating theatre.[12] Studies show better outcomes when doctors take the lead in healthcare services/organisations,[29] with around 30% of healthcare chief executives in the USA being doctors compared to less than 5% in the UK National Health System.[30] In this way, surgeons with the best leadership and managerial skills and knowledge can aspire to lead services and even develop their own organisations.[31]

5. How can leadership skills be developed through exploiting opportunities in the operating theatre?

In the operating theatre and in general, one comes across leaders who have entirely contrasting styles yet equal efficacy, making it difficult to create a uniform proto-type or role-model. As mentioned previously, Fig. 1 summarises some of the well known leadership models and theories, and gives a guide for selecting an approach that is most suited to both the individual leader and the situation that they are required to lead. We would suggest that developing leadership skills from an early career stage requires identifying the individual's strengths and level of emotional intelligence (EI) which is a more subtle and novel concept. Studies show that individuals who are particularly effective at identifying and maximising their own emotions as well as those of the group are able to lead more proficiently even from as early as medical student stage.[32]

These leadership behaviours we feel can be best learnt and practised through knowing which 'tasks' in theatre can be successfully exploited for this purpose. Below we outline a variety of areas in the operating theatre where opportunities can be seized to develop one's own leadership skills that vary from simple tasks such as managing distractions in theatre to larger scale formal

leadership research. We feel that whilst larger leadership projects can lead to new evidence and change, with regards to improving the efficiency and emotional climate in theatre, mastering small leadership tasks is invaluable for both trainees and seniors in the operating room.

5.1. Exploiting the 'micro-environment' of theatre

When exploring ideas around leadership learning in surgeons, one must appreciate the uniqueness of this environment. It is a relatively small, enclosed space, which creates an intense 'micro-environment', often hotter and noisier than a normal clinic or ward. Tuning in to the pattern of activity in the operating theatre and identifying opportunities where taking lead can improve productivity or calm, provides a key opportunity for leadership learning. Simple leadership techniques such as asking for mobile phones to be switched off prior to an operation or asking for noise levels to be kept to a minimum can eliminate distractions and thus improve team performance. (Other, similar examples of leadership development opportunities are highlighted in Table 1).

Identifying that events in theatre can be greatly unpredictable, with regular changes of pace, and concentration levels equips a leader with knowledge of when is an appropriate moment to approach another team member. Since stress levels can fluctuate rapidly, asking 'to send for the next patient' for example, at the same moment that an anaesthetic colleague is struggling to control the current patient's cardiac rhythm, can lead to communication becoming chaotic and unclear, serving only to induce stress with the potential for crisis. Learning to time interactions and requests of others appropriately is a way of developing improved awareness of others and your own impact on colleagues and surroundings. It also develops communication and teamwork, all of which lead the surgeon, no matter how junior, to become better at leading others.

5.2. Utilising the World Health Organisation (WHO) safety checklist effectively

The World Health Organisation (WHO) safety checklist, recommends introductions before, and debriefing after each case. A team briefing which includes stating individual requests and group strategies for the day such as 'aiming to send promptly for each patient' or 'allowing adequate breaks' provides a clear plan for all. It is also an opportunity to outline the correct equipment needs and key concerns for each case.[33] By participating and leading this process, surgeons wishing to develop leadership behaviours can appreciate what motivates others in working that day, and see that there is variation here. Leading effective debriefing sessions enables concerns/frustrations to be constructively voiced, giving an opportunity to develop conflict resolution skills, or praise and reinforce positive behaviours and practices.[34]

5.3. Partaking in research and assessment of leadership in the operating theatre

Numerous tools have been developed or adapted from other industries to assess leadership in the operating theatre, usually as one of many 'non-technical skills'. The most widely used of these assessment systems include:

- The Non-Technical Skills for Surgeons (NOTSS) scale[35]: an observational behaviour-rating tool rating surgeons during an operation. This analyses leadership specifically as one of four categories including 'coping with pressure,' 'supporting others' and 'setting/maintaining standards'.
- The Non-Technical Skills (NOTECHS) scale,[36,37] is adapted from the aviation industry, and defines leadership as adherence to best practise during procedure, time management, resource utilisation, debriefing, authority and assertiveness. Revised NOTECHS is also implemented specifically for crisis simulation.[38]
- Observational Teamwork Assessment for Surgery (OTAS)[39] looks at multidisciplinary contributions within the operating theatre, defining leadership as 'provision of direction assertiveness and support of team members'.

Through these tools and simulation studies, it has been recognised that leadership skills often cannot withstand stressful intra-operative scenarios in theatre,[40] paradoxically the worst time for them to wane. Most commonly, the operating surgeon leads the team, dictates the aims, direction and pace of the procedure, whilst simultaneously remaining aware of the patient's condition and needs. This means, inclusion of leadership capability as part of assessing surgeons and continuing professional development is of vital importance. By keeping abreast of the latest studies such as the review of leadership behaviours in surgeons (Henrickson-Parker et al., 2011)[41] and the recent use of focus groups to generate a rating tool for surgical leadership (Parker et al., 2012),[42] one can go on to generate ideas for projects in one's own hospital. In this way, and through incorporating the above tools, surgeons can develop extensive insight into which techniques work best and perhaps more importantly, how poor leadership can result in detrimental consequences.

5.4. Simulation and leadership training

There is increasing awareness that simulation training is a valuable adjunct to traditional teaching methods in surgery.[43] Leadership development is no exception. Research carried out in simulated operating theatres shows stress levels fall when communication and leadership is good, reducing errors and enhancing the surgeon's performance.[44] In this way, partaking in simulated leadership-training exercises both as an individual, and as a multidisciplinary team enables experimentation with different styles of leading and interacting without endangering patients. Tasks such as 'crisis simulation' can hone communication skills and develop the skill of leading under pressure, which may be practised over and over again. This opportunity is therefore a valuable investment in leadership development which positively correlates with patient safety and outcomes.[1]

5.5. Improving services and patient care

One of the key aspects of leadership as defined in the Medical Leadership Competency Framework[45] is the ability to appropriately utilise resources and understand the moral aspects of this, in a publically funded service particularly. From the offset of a surgeon's career, this area can be a focus of leadership learning. Projects that seek to improve length of stay, reduce re-admissions[46] can all be excellent ways for trainees to improve leadership skills, ahead of more traditional activities such as retrospective audit. These sorts of activities can alter with seniority; much larger change programmes such as the acquisition of new camera equipment or installing state of the art elective orthopaedic surgery suites can be excellent leadership and management projects for newly appointed attendings/consultants.

Improving care through simple low-cost initiatives encourages leaders in the operating theatre to standardise processes (e.g.

Table 1
Examples of how each team member can maximise opportunities to apply and practise leadership in the operating theatre.

Components of effective leadership	Potential Leaders/Team members	Behaviours/skills	Examples of leadership learning opportunities in the operating theatre
Ensuring patient safety	CS	Meticulousness	Use of WHO patient safety checklist
	JrS	Attention to detail	Thrombo-prophylaxis administration
	SR	Patient centeredness	Requesting antibiotic delivery at induction
	SR	Communication	Clear consenting and marking
	CS	Education	Appropriate choice of operation
	CS/SR	Written communication/instructions	Clear operation note and post operative instructions
Encouraging improvement and innovation	CS/SR/JrS	Familiarity with guidelines	Keeping up to date with literature/techniques/courses
	CS/SR	Audit and governance	Blame free culture at morbidity/mortality meetings
	CS/SR	Education of juniors in the importance of patient experience and patient journey	Encouraging junior involvement in audit and analysis of intra-operative events/outcomes
	CS/SR/JrS	Evidence based practise	Promote involvement in managerial role in hospital/trust/DH from young stage
Working effectively in a team	CS/SR/JrS	Support and value others and their contributions	Politeness when giving instructions/making requests (surgeon/scrub nurse/anaesthetist)
	CS/SR	Flexibility/adaptability	Communication and agreement when team is 'ready to send for next patient' or 'ready to start operation'
	CS/SR/JrS	Listening and communication	Helping transfer patient and set up theatre
	CS	Encouraging and nurturing individual specialist interests	Introductions/debriefing/regular forum for discussion of how team can evolve and improve
	CS/SR	Delegation/leading by example	Calm cohesive teamwork at all times[a]
Building and maintaining relationships	CS	Consideration/kindness/team worker	Well planned lists that do not overrun/considerate of other staff members[b]
	CS/SR	Supportive in a crisis	Patience when delays/complications arise/equipment failure
	CS/SR	Constructive feedback	Carrying out assessment for students/juniors in theatre
Teaching and training junior team members	CS/SR	Recognising areas for training	Allow junior/student to suture/intubate. Allow registrar to attempt complex anastomosis
		Adapting to the audience	Gentle questioning and teaching of medical students
		Multidisciplinary team education	Team discussion about order of list/type of anaesthetic/best use of theatre time
			Set targets and check goals are achieved as a team
			Welcome variation/alternative approaches/techniques. Simulation training as a team.
Developing Self Awareness (DPQ)	CS/SR/JrS/MS	Recognising own strengths/ weaknesses/limits	Fulfilling role as lead surgeon[c]/assistant effectively
			Supporting junior members and being aware of what else is going on in the room-anaesthetic changes/instructions
	CS/SR/JrS/MS	Knowing own role and that of others/when to lead or step back. Emotional intelligence communication and listening	Knowing when to give opinion/feedback and when not to. Clear instructions to others
	CS/SR/JrS	Flexibility/adaptability with situation	Familiarity with equipment and flexibility with shortages. Ability to handle challenges/crisis and knowing when to ask for help
Inspiring those whom you lead to an improved Performance	CS/SR	Setting clear goals and expectations	Team meetings/debriefings
	CS/SR/JrS/MS	Regular assessment/audit of practise.	Audits and performance assessments
	CS/SR/JrS	Reporting errors constructively	Incident reporting
Managing Resources/People and improving Services	CS	Business acumen	Requesting correct equipment and checking to prevent opening new sets.
	CS/SR	Prioritisation	Prudent use of ITU/HDU
	CS/SR	Correct selection and use of resources/operating environment	Selection of cases for day surgery/advance ordering of specific equipment/operating table/bed for obese patients
	CS/SR	Educates and explains reasons behind decisions/actions/urgency	Explain how and why list is a specific order
	CS/SR/JrS/MS	Ambassador for quality	Be an advocate for patient safety and patient experience

Key: CS = Consultant Surgeon, SR = Surgical Registrar, JrS = Junior Surgeon (Senior House Officer/House Officer), MS = Medical Student.
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designated operating theatres for designated specialities), create default positions (e.g. no case cancellation without clinical director involvement), and make design changes to facilitate communication (e.g. situating day-surgery units next to main theatres). Relatively minor alterations can make large differences in cancellation rates, unnecessary follow-ups and variations in care. For example, surgeons making a brief telephone call at the end of an operation to a nominated family member of the patient giving immediate feedback, is a near-zero cost intervention that positively impacts on patient and career satisfaction. Pioneering these sorts of changes, whether as a junior trainee or senior surgeon, should remain a focus for anyone wanting to be an effective leader in surgery.

6. Conclusion

Operating theatres provide an excellent micro-environment for the study and development of behaviours and non-technical skills. This intense, enclosed, rapidly changing environment is amenable

to providing a wealth of leadership development opportunities as leadership behaviour here plays such a pivotal role in effective performance. We feel the strongest leaders in surgery are those who incorporate the universal leadership skills such as the awareness of one's self and others with those specific to the field such as efficient use of resources and excellent personal standards of patient care. Surgical leaders can in this way not only increase patient safety and theatre efficiency, but also promote happier, healthier teams. Clearly, a surgeon's work and thus their leadership contribution is not limited to the operating theatre; but we think it an excellent environment to develop and build experience of leading and managing others effectively to achieve a common goal. Simple routine tasks such as the daily running of lists or leading a team briefing are indicative of leadership, and can then be enhanced via simulation-based modules or formal leadership education. Taken together these opportunities, both small and great should be embraced for developing the leadership ability of the individual, as well as promoting a positive environment for team members and better experiences for patients.

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Authors contribution

Suliman A - (1) the conception and design of the study, acquisition of literature, analysis and interpretation of literature, (2) drafting the article or revising it critically for important intellectual content, (3) final approval of the version to be submitted.

Klaber B - (1) revising the article critically for important intellectual content.

Warren O - (1) the conception and design of the study, (2) final approval of the version to be submitted.

Conflict of interest

None.

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