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# A protocol for wide awake local anaesthetic no tourniquet (WALANT) hand surgery in the context of the coronavirus disease 2019 (COVID-19) pandemic

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## ABSTRACT

There are new and unique challenges to emergency surgery service provision posed by the Coronavirus disease 2019 global pandemic. It is in the best interests of patients for care providers to streamline services where possible to maximise the number of cases that can be performed by limited surgical and anaesthetic teams, as well as minimising patient interactions and admission times to reduce potential spread of the virus.

There is evidence that wide awake local anaesthetic no tourniquet (WALANT) hand and upper limb surgery can meet this need in a number of ways, including reduced pre-operative work up, the lack of a need for an anaesthetist or ventilator, shorter inpatient stays and improved cost efficiencies.

Though updated national guidelines exist that advocate increased use of WALANT surgery in response to the pandemic there are not yet clear protocols to facilitate this.

We outline a protocol being developed at one UK Major Trauma Centre tailored to the expansion of WALANT hand and upper limb emergency surgery with particular emphasis on facilitating timely surgical care while minimising healthcare encounters pre and post-operatively. This will serve to reduce potential transmission of the virus and create cost efficiencies to free funding for COVID-19 related care.

Our protocol is easily replicable and may be of benefit to other centres dealing with emergency upper limb surgery in the new climate of COVID-19.

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## Introduction

The advent of the Coronavirus 2019 (COVID-19) global pandemic, caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has led to a rapid shift in emergency surgery service provision. Capacity to perform urgent surgery has been reduced due to the diversion of anaesthetists, theatre staff, anaesthetic equipment and surgeons to management of the current crisis.<sup>1</sup> Furthermore, it is increasingly the case that operating theatres are being repurposed as intensive care units making them unavailable

for operative procedures. However, there remains a burden of patients requiring emergency surgery that must be met.

The Plastic Surgery department within our National Health Service (NHS) Major Trauma Centre (MTC) in East London receives around 350 referrals per month and performs around 110 emergency hand/upper limb procedures. To cope with this demand, in 2017 we established a system of running regional anaesthetic (brachial block plus arm tourniquet)/local anaesthetic lists in addition to our general anaesthetic lists. The format is of two brachial block lists running simultaneously in adjoining theatres under one plastics consultant lead, with one anaesthetist administering the regional blocks for both

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**Table 1 – Conditions Suitable for WALANT surgery.**

Hand	Single Digit	Fracture, tendon, Laceration, nerve, nailbed and single vessel repair (IF no vascular compromise)
	Multiple Digit	As single digit IF can be completed within 2 h.
	Metacarpal	Fractures and dislocations (e.g. MCPJ/CMCJ)
	Other	Washout of superficial infection and removal of foreign body(s)
Wrist & Forearm		Lacerations + - tendon repairs, single large vessel repair IF can be completed within 2 h
		Soft tissue cover requiring local flap or skin graft
		Simple carpal fractures (scaphoid, trapezium, hamate)

lists. Continuity was achieved by the service being led by one designated consultant, the appointment of a designated upper limb trauma fellow overseeing the lists and the use of a fixed theatre nursing team. For the patient this approach minimised time to procedure, as more cases could be done on a given surgical list, and avoided the risks associated with a general anaesthetic.<sup>2</sup> For our trust this approach offered greater cost efficiency as fewer operating lists were required, fewer staff were required to run the theatres and patients were able to be safely discharged more quickly, as is reflected in the literature.<sup>3</sup>

Despite these gains, the aforementioned diversion of resources towards management of the COVID-19 pandemic has forced a dramatic reduction in available operative lists within NHS Hospitals, creating impetus to further adapt how we manage this patient group. Though extra provision for theatre availability has been made by NHS England's deal with the private sector<sup>4</sup> these come at an additional financial cost and may not meet the service demand. The British Society for Surgery of the Hand (BSSH), British Association of Plastic, Reconstructive and Aesthetic Surgeons (BAPRAS) and affiliated societies have published COVID-19 specific guidelines that advocate managing hand fractures conservatively where possible, aiming to perform procedures under local anaesthetic or WALANT and aiming to follow up patients remotely to minimise outpatient visits.<sup>5</sup>

## Background

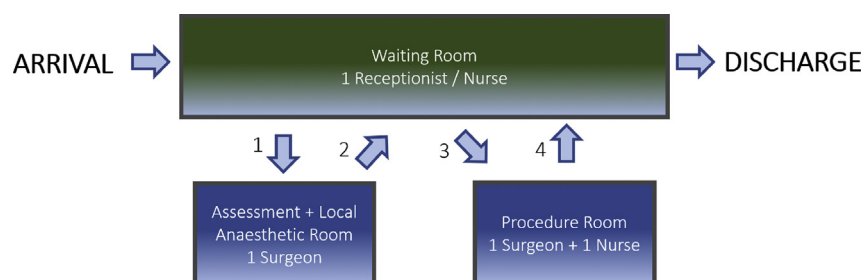
WALANT surgery is, as the name suggests, the practice of operating on the upper limb and hand with a patient awake and with no tourniquet on the arm, by creating a field block using local anaesthetic combined with adrenaline. Adrenaline is added primarily to reduce bleeding that otherwise obscures the surgical field but it also serves to prolong the effect of the anaesthetic agent. Bleeding is further reduced by allowing sufficient time for maximum action of the adrenaline (at least 30 min) before operating.<sup>6</sup> WALANT surgery has the advantage of allowing tendon repairs/transfers to be actively tested intra-operatively as the patient is awake and able to move their hand. Patients can also be educated intra-operatively which may improve their rehabilitation.<sup>7</sup> Patients are spared the pain associated with the use of an arm tourniquet and this, combined with the extended length of time that the adrenaline/lidocaine field block provides, means that patients generally require less

post-operative analgesia, and make a more rapid recovery than if they had undergone a general anaesthetic.<sup>7,8</sup> A number of conditions can be operated on under WALANT (Table 1).

Advantages of WALANT that are of particular relevance to the current COVID-19 crisis are as follows: Preoperatively, patients undergoing WALANT surgery do not require separate appointments for anaesthetic assessment and tests which reduces potential viral transmission. This also means that the surgeon can assess an injury and potentially operate on the same day. Intraoperatively, the lack of need for an anaesthetist, ventilator and, by extension, a formal operating theatre means that these resources are free to be diverted to COVID-19 related care. WALANT surgery can take place outside the operating theatre setting with no compromise to sterility and no associated increase in post-operative medical or surgical complications rates.<sup>9</sup> Intraoperatively, anaesthetists and patients are not exposed to one another in the context of the aerosol generating procedure of intubation. Post-operatively, patients undergoing WALANT surgery tend to have reduced recovery time which leads to shorter inpatient stays,<sup>10</sup> further reducing potential viral transmission and reducing burden on medical resources and staffing. It has also been demonstrated that WALANT surgery offers significant savings due to shorter operating times and reduction in consumables use which again frees healthcare resources to be diverted elsewhere.<sup>10</sup>

Disadvantages of WALANT surgery are that there is a learning curve initially for the surgeon in terms of optimal administration of the field block and in working in a surgical field that is not completely dry - as the adrenaline cannot entirely replicate the dry field achieved by a tourniquet. WALANT is not suitable for patients with compromised peripheral circulation or severe cardiac disease due to the need for the use of adrenaline.<sup>11</sup> WALANT is also not suitable for patients who are anxious, non-compliant or who actively want to be asleep for their procedure.<sup>11</sup> WALANT services tend to be senior led, and with the associated drive for minimal staffing there may be reduced training opportunities for junior surgeons. A move towards WALANT surgery may also adversely affect training opportunities for junior anaesthetists.

The adoption of WALANT hand and upper limb surgery has grown steadily following Lalonde's 2005 study into the safety of adrenaline use in the fingers<sup>12</sup> which did much to alter the long held belief that there was a significant risk of tissue necrosis or digit loss when adrenaline was added to local anaesthetic in upper limb surgery. Lalonde ascribes the continued growth of the WALANT approach to: a) The



**Fig. 1 – WALANT Clinic pathway.**

availability of online educational material on how to perform WALANT surgery, and b) the support and promotion of WALANT surgery by a number of world opinion leaders in hand surgery.<sup>6</sup> In addition to this, and as a reflection of the growing interest in WALANT surgery, there is an exponentially growing body of literature on WALANT surgery.<sup>13</sup>

Herein we present the protocol being developed within our NHS MTC to best utilise the above advantages that WALANT surgery offers cases in the context of the COVID pandemic.

### WALANT COVID-19 protocol for hand and upper limb emergency surgery

#### Guiding principles

- 1) Where possible patients will be assessed and operated on as part of a single healthcare encounter.
- 2) Where possible procedures will be performed under WALANT.
- 3) Staffing will be minimised.
- 4) Personal Protective Equipment (PPE) in keeping with current UK guidelines will be worn by all staff to minimise potential spread of COVID-19.<sup>14</sup> Patients attending appointments will also be advised to wear surgical face masks as per current UK guidelines.<sup>15</sup>
- 5) Where possible, physical follow up post discharge should be minimised.

The goal is a ‘one stop surgical shop’. Three areas are required, run by a total of four staff members: two surgeons and two nursing staff (Fig. 1).

The Waiting Room, populated by one nurse, needs to be large enough to allow the patients to be appropriately separated to minimise the chance of viral transmission. The seating needs to be laid out in a way to ensure patients remain an adequate distance apart. Patients will be asked to attend alone, with family/friends accompanying them to remain outside the hospital, contactable by telephone once the procedure is complete. Exception would be made for patients requiring physical assistance.

The Assessment Room, populated by one surgeon, requires a computer to access imaging and medical notes, simple dressings and good lighting. If the patient requires a procedure they would be consented and the field block of local anaesthetic would be given here. Should a procedure not be required, or the procedure not be possible under WALANT

surgery, the patient would have follow up booked or be discharged directly from here.

After administration of local anaesthetic, the patient returns to the waiting room for the requisite 30 min that the anaesthetic requires to take effect. A COVID-swab is also taken at this stage for disease monitoring.

The Procedure Room, populated by one surgeon and one nurse, does not need to be an operating theatre and could be a clinic or office room. However, it must be stocked as any operating theatre would be in order to create a sterile environment and operate on all injuries or infections that can be managed under WALANT surgery. Key equipment includes adequate lighting, a C-arm image intensifier for the management of fractures, bipolar cautery and a resuscitation trolley (for the unlikely event of local anaesthetic toxicity).

Ideally the Assessment room and Procedure room are in close proximity so there is potential for the assessing surgeon to assist the operating surgeon should the need arise. Having this flexibility would not only support efficiency of the service but also facilitate training opportunities for the junior of the team.

A variation that we predict may help manage high case-loads (such as ours) is to feed two procedure rooms from one assessment room. Though this would increase staffing levels it would not increase the overall number of staff/patient interactions in the protocol pathway.

Following the procedure, the patient returns to the Waiting Room. A computer and printer should be available to provide clinical summary and discharge paperwork. It is stocked with dressings, analgesia and antibiotics for patient discharges in order to avoid the need for a visit to a pharmacy on their way home.

Follow up for dressings changes, wound checks and hand therapy that would normally bring patients back to the hospital should be tailored case by case. There is evidence that many patients can be satisfactorily followed up by video call or phone.<sup>16</sup> Hand therapy exercises and monitoring of progression can, for select patients, also potentially be done via video call or phone.

### Discussion

In terms of the reduction of risk of transmission of COVID-19 the key advantage of this protocol is the minimising of interactions, both in reduction of number of visits to the

hospital, and reduction of interactions with hospital staff on the day of assessment/surgery.

The separate pre-operative interaction with a surgeon in which the patient is assessed in the emergency room or clinic is no longer required. The separate pre-operative interaction with an anaesthetist and associated pre-operative testing which may require interactions for taking blood, imaging, or other tests, is no longer required. Peri-operatively staffing is minimised and, due to the relatively rapid recovery and discharge after the surgery, time spent in proximity of staff and other patients is also minimised. Post-operative follow-up with repeated visits to the hospitals can (in many cases) be greatly reduced through remote follow up appointments.

In terms of improving use of resources, the advantages of this protocol lie in two main areas. The first is reduction in diversion of anaesthetists and anaesthetic equipment from COVID-19 related care. The second is simply that WALANT surgery is more cost effective than surgery under general or regional anaesthetic which makes more funding available to manage the pandemic.

### Limitations

Quality of telephone triage prior to seeing patients (in the above pathway) is key to ensuring the right patients are seen i.e. patients who are likely to benefit from surgery and cannot be managed conservatively. Due to our status as a Major Trauma Centre, a number of our hand trauma patients are not suitable for WALANT as their hand injuries are concomitant with other (often life threatening) poly-trauma injuries. As this protocol is new to our trust there is no outcome data as yet. Information to be collected will include as a minimum: Time from injury to procedure, operative time of procedure under WALANT surgery, length of admission, number of staff/patient interactions associated with management of the injury including outpatient follow up and total cost of the procedure. Demonstration of a reduction in transmission of COVID-19 as a result of the protocol would be very difficult to assess as routine testing is not widely available at present and there are many factors outside the healthcare setting that influence its spread.

### Summary

The equipment, staffing and clinical environment requirements of this protocol are simple so it can easily be replicated at other centres. Necessity is famously ‘the mother of invention’<sup>17</sup> and we predict that the current COVID-19 pandemic will accelerate the uptake of WALANT surgery through pathways like the WALANT COVID-19 Protocol as above described.

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