

Proposal for selective, risk-modified recommencement of national service for adult living kidney donation program in the West of Scotland and paediatric living kidney donation program for all Scotland.

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Situation:

Whilst the national service for selected, priority deceased donor kidney transplantation has been maintained for both adults and children, living donor transplantation has been paused since March 10th, 2020 because of the risks to donor and recipient patients relating to COVID19.

Most other aspects of renal failure surgery, particularly vascular access surgery, are semi-emergency in nature and have continued within the parameters of available theatre lists and anaesthetic manpower.

Living donor transplantation is the most effective form of renal transplantation with the lowest risk of significant peri-operative complications a shorter hospital stay and better long-term outcomes. Furthermore, it offers the potential advantage of pre-emptive transplantation and avoidance of the need for haemodialysis. Critically, in the environment of a SARS-COV-2 pandemic, all end-stage renal disease patients (ESRD) fall

into the category of high risk with a requirement for shielding but the practicalities of hospital haemodialysis make that impossible. Living donor kidney transplantation therefore represents a potential way for recipients to avoid a risk of exposure in having to commence or continue in centre haemodialysis.

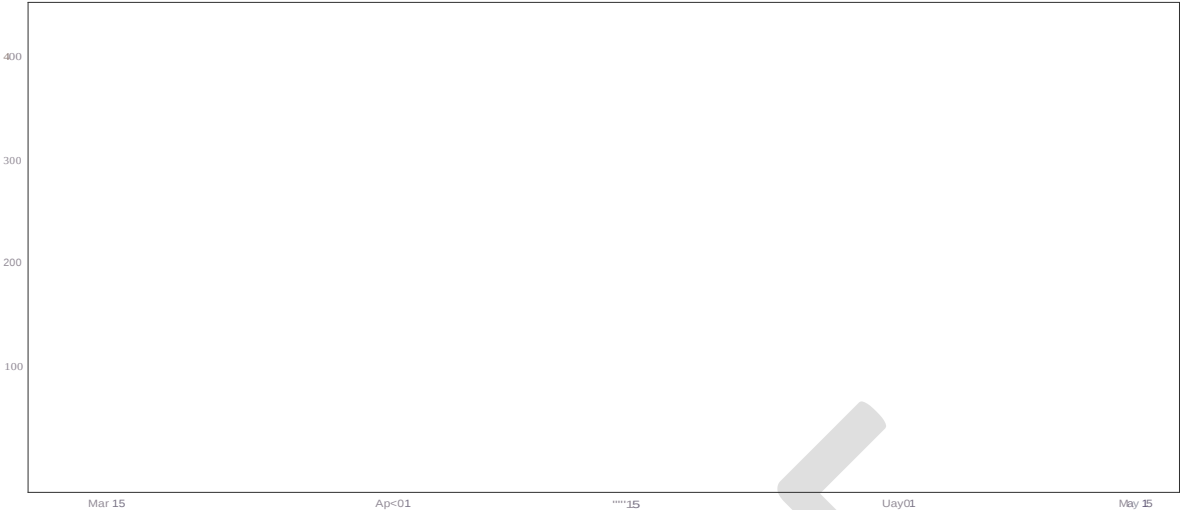
However, this necessitates exposure of a fit and well donor to an operation and hospital admission during this current SARS-COV-2 pandemic. Reports from centres with a high prevalence of COVID19 disease have suggested that the development of SARS-COV-2 infection pneumonia following routine elective surgery has resulted in as many as 50% of patients requiring ICU care and a mortality rate of 20·5% in some series. There is no evidence to suggest either transmission rates or outcomes of surgery in the relevant GGC sites have reached this level and the far lower observed rates are quoted below. The risk of nosocomial spread in a 'clean' or COVID19 risk-minimised site' for a screened and previously shielded population is not known but is likely to be far more favourable.

Numbers of SARS-COV-2 infected patients are plateauing in Scotland similarly to rest of the UK. However, the virus will not be eradicated in the foreseeable future and no vaccine will be available on a large scale for some time. The risk, therefore, of community acquired and nosocomial COVID19 disease will be a reality for renal patients for the foreseeable future. Most renal failure patients experience a gradual (and sometimes more rapid) progression of their condition and a steady stream of low clearance patients migrate to a requirement for renal replacement therapy (RRT) with every passing period of time. Additionally, incident patients continue to present, some with an immediate requirement for RRT ("crash landers") and lose their ability to effectively shield without access to transplantation. Even COVID19 itself, when severe, can be associated with significant acute kidney injury. It is highly likely that some of these patients will suffer permanent nephron mass loss and may join the ever-growing cohort of renal failure patients.

Neglect of maintaining transplant activity for any prolonged period is therefore associated with multiple risks. Indeed, the "Adult Elective Surgery and Procedures Recommendations" from the Centers for Medicare and Medicaid in the USA classify

organ transplants as “Tier 3b” (high acuity surgery / unhealthy patients) with the consecutive action directive “Do not postpone.” It is therefore necessary to consider various options to recommence provision of optimal renal replacement therapy to potential recipients in the knowledge that the outcomes for patients in terms of mortality are poorer for those who have to undergo longer periods of dialysis prior to renal transplantation. The key problem relating to delivering that is how to reduce risk to donors and people with renal disease during the current situation of high COVID19 risk.

General population of Scotland



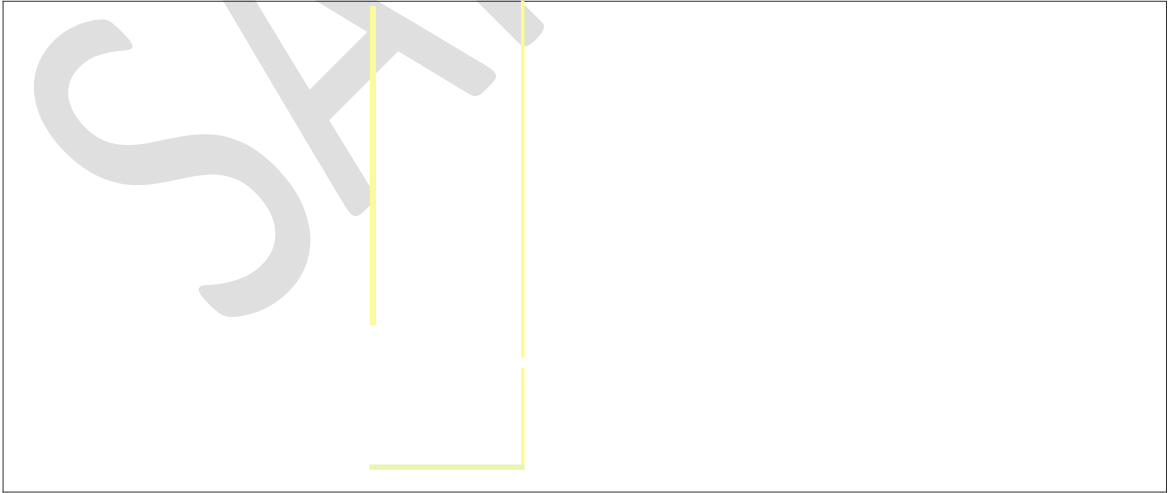
Source: Scottish Government

RRT patients



Source: SERPR

Transplant patients



Source: SERPR

Figure 1 – trends in new daily COVID-19 cases and seven day moving average in Scottish general population, as well as patients on renal replacement therapy and transplanted patients in West of Scotland; note that shielding letters sent in early April

Currently in Glasgow there are 9 fully worked up living donor pairs who were already scheduled or awaiting a date at the time of program pause, with 20 others close to completing the rigorous and thorough work-up required prior to surgery. Sadly, one paediatric ESRD patient whose transplant, scheduled for May 2020 was cancelled due to the COVID19 pandemic has already, sadly died. The living donor program remains suspended, however, in the 2 months since pause, further unquantified patients have inevitably progressed to the stage where living donor transplant should routinely proceed and the full backlog will be evident once clinic consultations can resume but can be estimated from the natural yearly unit activity of 60 transplants per annum as growing at the rate of 5 per month on average.

Cautious reintroduction of both the adult and paediatric deceased donor transplant program has been met with initial success with 7 successful transplants safely achieved (6 adult and 1 paediatric) at the time of writing without nosocomial COVID19 infection. To achieve that, extensive logistical changes have been made to the conformation of the transplant unit and pathways in the department to minimise the risks for immunosuppressed transplant patient population from contact with known or unknown COVID19 disease. Building on the wider health board measures, it appears so far that an environment suitable for safe renal transplantation has been preserved but continuous vigilance and monitoring continues.

This documents sets out proposals for an approach to consider strategies to restart a living donor transplant programme in order to minimise both donor and recipient risk in the context of the SARS-COV-2 pandemic, initially for those donor recipient pairs who have completed their workup.

Additional factors will include the need to restart investigations for those donor recipient pairs currently in workup and this will be dependent on the restart of routine radiological services.

Overall, we present a strategic framework to reintroduce the living donation program, with the aim of realising the benefits of living donation in the children and adults currently suffering on dialysis.

SAMPLE

Background

Living donor transplantation is a complex service to reintroduce during this COVID-19 pandemic. It requires consideration of the risk of COVID-19 to healthy living donors and recipients from an elective surgical procedure, as well as the risk to staff involved in delivering the program, mainly pertaining to the theoretical risk of aerosol-generating procedures during the donation surgery. Without a vaccine or treatment, the most robust strategy should focus on screening to identify COVID-19 and exclude those patients from the pathway, in tandem with shielding of patients both before and after surgery.

Risk of infection and the requirement for pre-operative screening

COVID-19 is highly infectious, and capable of transmission before an afflicted person feels unwell. It has spread rapidly globally, and nosocomial infection to and from both patients and staff may be common. In a single centre cohort study from Wuhan, 41% of infections seemed to have been acquired in hospital. (Wang D, JAMA 2020)

Furthermore the virus can be infectious during the pre-symptomatic stage. Computer modelling of a nursing home outbreak in Washington demonstrated 44% of cases were acquired during this pre-symptomatic phase (He X, Nat Med 2020). This raises the significant issue of both patients and healthcare staff being unwitting vectors of the illness, which must be addressed by satisfactory screening protocols to maintain the safety of the program.

Risks of elective surgery in current environment

Concern regarding the safety of elective surgical procedures for patients has been raised in the context of COVID-19. This has led to an almost complete cessation of elective surgical activity, with all but the most urgent cancer surgery postponed for the time being. Initial data from Wuhan demonstrated that the development of COVID-19 pneumonia following elective surgery carried a mortality rate of 20% (Lei, Lancet 2020). Those that died had significant comorbidities, such as malignancy or cardiovascular disease. ***All patients in this series were in the incubation phase of the disease prior to***

the procedures. Further multicentre data on known COVID-19 positive patients undergoing both emergency and elective general surgery demonstrated that post-operative pulmonary complications occur in 50% of patients. Overall, 30-day mortality was 23.8%. Historical data for comparison from the National Audit of Emergency Laparotomy demonstrated a 30-day mortality rate of 16.8% in high risk patients (private communication prior to publication, Bhangu A). The presence of COVID-19 at time of surgery appears to significantly increase surgical risk.

These data clearly demonstrate the inappropriateness of elective surgery in the context of high disease prevalence and rate of spread and validate the earlier decision to pause such work. For resumption of safe elective services, evidence is needed that such conditions have abated and protocols must be in place to identify COVID-19 positive patients pre-operatively to exclude them from surgery until their illness has resolved.

Local environment and evidence of risk of nosocomial COVID19 disease as at May 15th 2020

Over the last 7 weeks, We have reviewed 94 renal surgery patients having admissions for emergency (n=44) and elective surgery (n=50), and only 2 have tested positive for SARS-COV-2 in the month since their admission; both positive patients were following prolonged emergency admissions, one with positive PCR 2 days after discharge and the other 11 days after discharge. This corresponds to a nosocomial transmission rate of at most 2% in our unit's experience and in the environment prevalent in NHSGGC between mid-March and early May 2020. This is reassuringly far safer than reports from higher risk environments and suggests the risks are no longer prohibitive.

Individual risk assessment and governance for cases

Some groups carry a more significant risk of progression to severe COVID-19 infection. Increasing age, male sex, race (Black and minority ethnic groups, excluding Chinese females), obesity and cardiovascular disease are the most consistently found risk factors (Jordan RE, BMJ 2020). The highest post-operative mortality rates were seen in males over 70 (private communication prior to publication, Bhangu A). In order to

balance the specific risks to any of the broad variety of individuals who may benefit from living donor transplantation, documented **multi-disciplinary assessment and endorsement of all donor pairs will be essential** to ensure that all risk factors have been considered in the appropriate context, and higher risk candidates screened out in the initial phase of reintroduction.

Specific risk associated with donor surgery

The living donor procedure is a hand-assisted laparoscopic procedure which is aerosol generating. This carries a theoretical, but as-yet unquantified, risk to staff. During a procedure, ultrasonic scalpels or diathermy can create smoke which does not completely deactivate virus particles. Corynebacterium, HPV and HIV have been detected experimentally. Transmission of HPV related to surgical smoke has occurred in rare circumstances. (Stratton M, Infection Control Today 2020) No nosocomial COVID-19 infection via an aerosol generating procedure has been reported yet, nor have viable COVID-19 virus particles been detected in surgical smoke (CDC 2020). Current guidelines on the use of laparoscopic surgery remain disparate between various surgical societies. The British Association of Urological Surgeons have recently issued guidance to minimise the risk to staff when performing laparoscopic procedures through the use of personal protective equipment, ultra-low particle air filters and gradual reduction of pneumoperitoneum. This advice is reflected by the American College of Surgeons. The Royal College of Surgeons of England - with a focus on GI procedures of theoretically much higher risk of aerosol generation containing enteric virions - state that laparoscopy should only be used in cases where the mortality benefit is substantially beyond doubt. This advice has been strictly followed for some weeks but at the time of writing selected abdominal laparoscopic procedures have recommenced in GGC. Safety of staff is paramount, and all measures should be implemented for their protection. A combination of recommended safety measures with pre-procedural screening to ensure no patients with COVID-19 are undergoing living donation is essential. Laparoscopic surgery offers the lowest risk for donor respiratory and hernia complications and optimises recovery time. Laparoscopic living donor surgery would appear essential if rapidity of

discharge and associated reduction of exposure to nosocomial COVID19 is desired.

Effect of transplantation on risk of death generally

Renal transplantation generally confers a survival benefit compared with remaining on dialysis, as well as marked improvement in quality of life and reduction in healthcare costs. This survival benefit appears to remain the case despite the effects to date of the current COVID-19 pandemic, as illustrated by the Kaplan-Meier plot below, showing survival from 1st February 2020 for patients in the West of Scotland on hospital haemodialysis vs. transplant patients (including those on long-term transplant follow-up). The hospital haemodialysis group was restricted to patients fit enough to have been included on the transplant waiting list. Survival at 90 days was 98.6% for transplant patients but only 96.3% for hospital haemodialysis patients (HR 0.48 for transplant vs hospital HD (95% CI 0.25-0.93, Logrank test $p=0.0016$). It should be noted that these figures are systemically biased against the transplant follow-up group as not all long-term post-transplant patients are fit enough for another transplant, yet the whole group is being compared against the subset of haemodialysis patients fit enough to be listed for transplant.

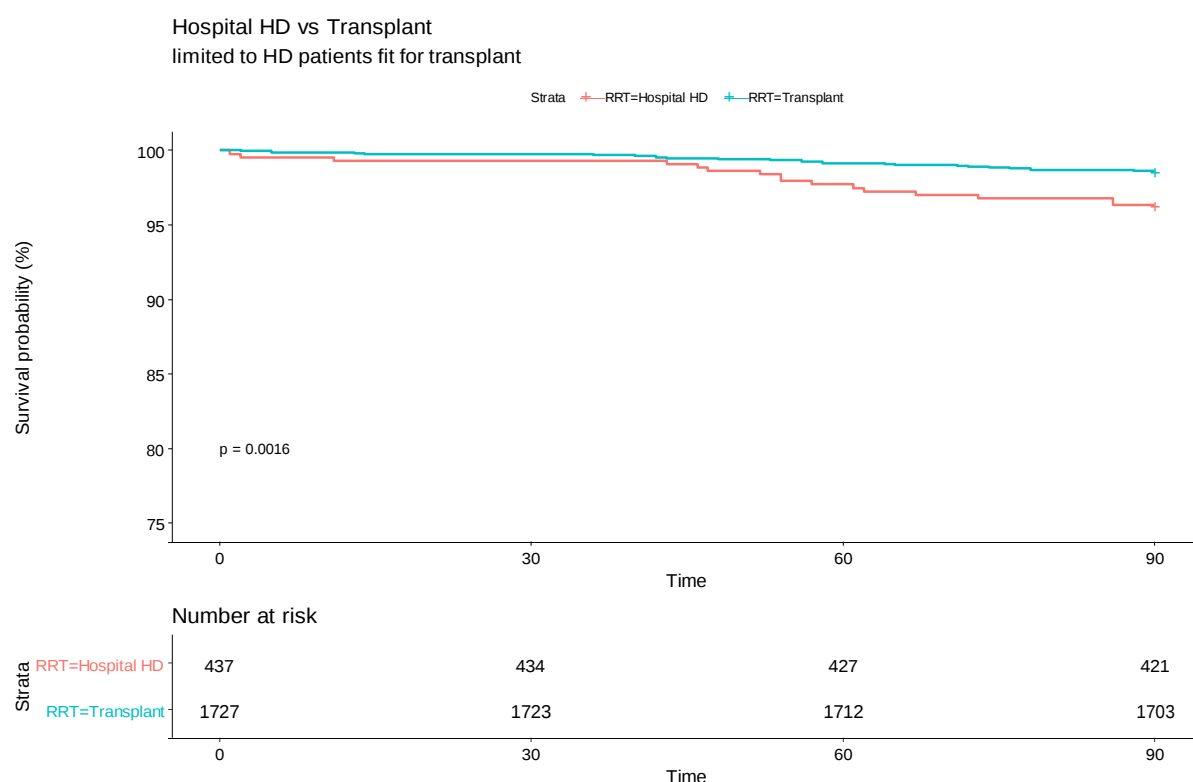


Figure 2: survival benefit of transplant vs hospital haemodialysis in patients in the West of Scotland

Compared with hospital haemodialysis patients, patients who are pre-dialysis, on peritoneal dialysis or home haemodialysis have the potential to shield and are on protected lists of shielding patients. Theoretically, hospital haemodialysis are also on supported shielding, but this is necessarily less effective in patients who must travel to hospital three times per week, often in shared transport, to dialyse in close proximity to other patients for four hours at a time.

Effect of transplantation on risk of death from COVID19 disease

Data comparing the relative risk of death from COVID19 between transplanted and transplant-eligible patients is limited however based on experience so far, observed rates of death among the waiting listed haemodialysis patients appear higher (table 1.) It should be noted that these are early figures.

RRT	Populati on	Tests	Positive	Recovered	Deaths	Death rate
Hospital HD <i>(fit for transplant)</i>	437	157	21	15	4	0.9%
Peritoneal dialysis	66	4	0	0	0	0%
Transplant	1762	1114	16	9	5	0.3%

***Table 1 – outcome of testing for COVID-19 in dialysis and transplant patients.
Deaths are all deaths following a positive PCR for SARS-CoV-2. The hospital
haemodialysis patients included are all fit enough to be listed for transplant
surgery; by way of comparison, once all 983 hospital haemodialysis patients in
the West of Scotland are included, the death rate is 1.4%***

Assessment:

What are the ways we can reduce the risk for our patients deemed suitable for surgery?

Institutional and NHSBT Governance

Issues for transplant units to consider from the NHSBT document:

- Appropriate Trust/Board support and approval.
- Involvement of GGC leads for anaesthetics & critical care, nephrology and infection control in discussions, with their support to re-open **elective live donor** transplant services.
- Fulfilment of local clinical governance requirements. *The transplant MDT and M&M has remained functional on a remote basis throughout the pandemic.*
- The availability of the appropriate multi-disciplinary team. This includes transplant medical and surgical staff and also other essential staff. *The transplant MDT has remained functional on a remote basis throughout the pandemic.*
- Awareness of the challenges of performing donor and transplant surgery while wearing appropriate personal protective equipment. *The unit continues to undertake deceased donor transplantation and has a robust theatre pathway in place.*
- Access to ward beds, operating theatres, critical care beds, and anaesthetic cover with appropriate staffing levels and skills mix. *The unit continues to undertake deceased donor transplantation and has a robust theatre pathway in place.*

- Access to the necessary equipment and materials including personal protective equipment, blood products, specialised equipment (4K Laparoscopic stack), organ support services (e.g. inpatient haemodialysis provision,), organ preservation fluids, and anaesthetic agents. *The unit continues to undertake deceased donor transplantation and has a robust theatre pathway in place.*
- Assessment and monitoring (potentially remotely) of patients on the active and suspended transplant lists. *JA has been undertaking this on a regular basis and after discussions at MDT*
- Access to routine unit diagnostic work-up and monitoring investigations.
- The local incidence and prevalence of COVID-19 and how these might impact on potential donors and recipients. *This can only be assessed through Scottish government data and SERPR local data and JA is consistently reviewing this and it is discussed at weekly consultant meetings.*
- Patients on the active transplant list should be advised to undergo shielding to reduce the risk of SARS-CoV-2 infection, where this is possible.
- The separation of pre- and early post-transplant patients from those with suspected or confirmed SARS-COV-2 infection during an inpatient stay, and in the outpatient follow-up period. Where possible, pre- and early post-transplant patients should be cared for in single rooms in **Non-SARS-COV-2** wards to minimise risk of SARS-CoV-2 transmission.
- Capturing data for the NHSBT living donor registry on the donation episode and immediate post-operative recovery to ensure outcomes are accurately recorded. *Glasgow has continued to report to NHSBT for deceased donor transplantation and would continue to do so for living donors and live donor transplants*
- Staffing for 'clean' site will require a designated pool of anaesthetic and surgical consultants, who may need to work outside their employing trust. Appropriate

governance arrangements will be required to support this, such as honorary contracts.

Donor Recipient Pair Prioritisation

A phased approach to re-introduction of living donor programmes is recommended given the ability to plan donor-recipient pairs.

The initial phase is expected to include pre-existing identified or cancelled pairs considered low risk.

Living donor factors to consider: age, underlying organ function, co-morbidities, surgical complexity.

Living Donor MDT to discuss all pairs for transplant in current situation and document multifactorial risk assessment using the criteria below to minimise recipient risk

- On HD currently with LD ready.
- Pre dialysis but at risk of migration to dialysis in next 2-3 months
- Low immunological risk transplants (Simulect induction) but could potentially consider level 4 mismatch with no DSA as will start immunosuppression pre-emptively.
- Need for augmented immunosuppression can be considered but in exceptional circumstances (i.e. life-threatening vascular access difficulties)
- As capacity allows commence assessment of new referrals and consider re-inclusion or phased inclusion of suitable donor & recipient pairs in the October UKLKSS (deadline for registration of new pairs – 7th October, confirmation of inclusion 15th October)

Healthcare Environment Factors

The prevalence of SARS-COV-2 infection in the general population and dialysis population is likely to vary with time and according to factors such as the social distancing measure in place which will themselves be eased or tightened. In addition to the daily, real-time monitoring of the transplant unit and wider hospital status, the

living donor programme will be monitored on a weekly basis taking into account information from the sources listed below and can be suspended if any of the factors below identify concerns which increase the risks to donors or recipients significantly.

- Regular real-time monitoring of the RDUs across the West of Scotland symptomatic and SARS-COV-2 INFECTION – 19 positive PCR results. This is currently available using the crystal reports designed by Dr Jamie Traynor on SERPR.
- Hospital and GGC wide reports on new admissions with SARS-COV-2 infection and HDU/ ITU capacity.
- Regular reassessment of medical, nursing and surgical staff for symptoms
- Potentially regular screening tests may be applied to minimise exposure to patients of staff in an asymptomatic phase although *this is not currently undertaken and the feasibility of this would require further assessment particularly if and when social distancing restrictions are eased*. The following study has demonstrated that a significant number of staff were asymptomatic carriers at the peak of infection (>7%) and that even at 5 weeks after peak prevalence, asymptomatic staff positivity is 1.1% (Treibel et al. Lancet May 2020).

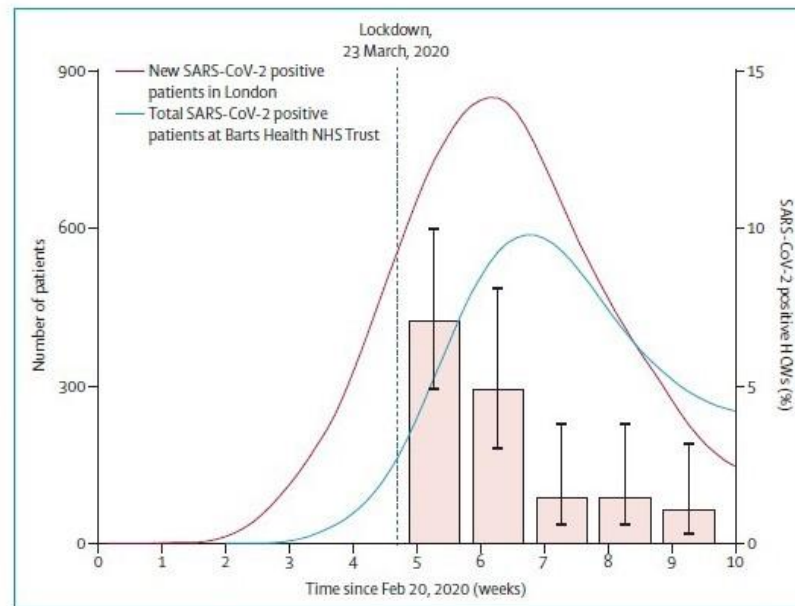


Figure: Number of patients testing positive for SARS-CoV-2 in Greater London and Barts Health NHS Trust and proportion of the HCW study cohort with SARS-CoV-2-positive nasal swab
The left y-axis shows number of daily new SARS-CoV-2 positive patients in the Greater London area, derived from Public Health England data (red curve) and the total number of SARS-CoV-2 positive inpatients at Barts Health NHS Trust (blue curve). Both curves show 7-day averages. The right y-axis shows the percentage

- Elective theatre capacity to facilitate living donor transplantation. This will need to be in addition to current theatre capacity as the need for elective and emergency vascular access work will need to be maintained in keeping this the principles of equity of access to procedures for HD patients.
- Support from anaesthetics and appropriate skill mix for live donor nephrectomy anaesthesia. A current protocol exists for this.

Donor Pathway for already worked up Pairs

Screening of potential living donors for SARS-CoV-2 infection and the need to check for symptoms will need to be undertaken. Testing for SARS-CoV-2 infection in asymptomatic potential living donors at the start of assessment and prior to planned surgery will need to be implemented within appropriate time frames prior to donation to minimise risks of cancellation, postponement and risk of asymptomatic nosocomial

transmission. The potential recipient must be informed that negative tests are not a guarantee of absence of SARS-CoV-2 infection. Similarly, false positives can also occur. These issues will be subsumed within the counselling and consent process.

Preoperative Consent

- In addition to the usual pre-operative consent, we need to include consent in relation to SARS-COV-2 situation including, alternate treatment options, additional post-operative risks, the importance of pre and post-operative shielding, pre-operative testing, implications of the false negative and false positive pre-op test results and contracting SARS-COV-2 disease as nosocomial infection.
 - This consent should also include an explanation of the current ever-changing situation in advice regarding SARS-COV-2 disease as new information becomes available and operation may not go ahead if the current situation changes
 - In the event of a development of a complication, patients may need to stay in hospital for longer period than expected and some patients may die from their complication. Patients need to be made aware that they will not have their family and friends visiting and supporting them during this difficult time adding difficulty for them and their family members
 - Plan for SARS-COV-2 test positive asymptomatic patients to remain at home and self-isolate for 14 days if asymptomatic
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- ***Enhancing patient safety and recovery***
 - Shielding prior to procedure 2 weeks
 - Confirm impact assessment on household contacts and transport arrangements (reduced ability to use public transport) in the post-operative period

- o SARS-COV-2 PCR at final crossmatch and 48 hours before admission
- o A comprehensive social history is required, with details of the patient's social distancing practices and of those within their household, in order to build a picture to inform a risk assessment at final crossmatch. SARS-COV-2 PCR at final crossmatch and before admission
- o At final crossmatch
 - ✦ Review by Pharmacist / Surgeon with consent / Nurse Practitioner
- ✦ Radiological assessment of chest in accordance with radiological guidelines
- o Symptom screening questions prior to admission
- o Examination must include a careful chest assessment with measurement of peripheral arterial oxygen saturations.
- o Admission on day of surgery to non-acute SARS-COV-2 INFECTION site
- o Side room / single room
- o PPE as for any close patient interaction
- o Regular staff screening for early identification of asymptomatic carriers if this becomes supported by local/national guidelines

Procedure: Hand assisted laparoscopic donor nephrectomy

- Laparoscopic surgery is potentially an aerosol-generating procedure AGP (like electrocautery of any blood/tissue/fluid).
- Laparoscopic surgery offers the lowest risk for donor respiratory and hernia complications and optimises recovery time.
- There is, currently, not enough evidence to either recommend or prohibit the use of laparoscopy. However, it is known that minimising operating time,

maximising patient safety & promoting expedited patient recovery are key considerations to weigh against possible risk of viral aerosolisation.

- Minimisation of chest complications (atelectasis / pneumonia) may be particularly important in reducing the overall risk to the patient from surgery
- The following are strongly advised when considering and/or performing laparoscopy surgery, to reduce risk to providers and patients:
 - o Only operate on cases which have been discussed by local MDT
 - o Minimise theatre personnel & use experienced surgeons with no training during cases.
 - o Use an anaesthetist familiar with laparoscopic surgery to minimise the risks of intra-operative patient coughing and straining.
 - o Use continuous circulation of insufflation (i.e. AirSeal™ system by CONMED USA) to decrease the accumulation of higher concentration surgical smoke in the abdomen.

(BAUS guidance for mitigation of risk during Laparoscopic surgery)

- **Transplant Coordinator 1 Role**

- Meet donor when they attend for admission / admit if required
- Meet with donor surgeon and theatre staff and attend brief
- Complete paperwork for kidney and coordinate transportation to QEUH
- Liaise with Tx Coord 2 regarding ETA
- Follow donor back to ward and support staff with post op care and ERAS protocol

- **Staff safety**

- o Current PPE arrangements for any interaction.
- o Regular staff surveillance for early identification of asymptomatic carriers if supported by local/national guidelines
- o Surgeons and anaesthetists will need to maximise use of theatre time, with consultant-delivered procedures and, where possible, dual-consultant operating to reduce theatre times and the number of people in theatres who may be exposed to aerosols.
- o Hand assisted laparoscopic procedure – negative screening PCR and CXR prior to procedure limits risk of laparoscopy as an aerosol generating procedures to staff in conjunction with appropriate PPE.
- o ***2nd consultant availability for support of operating principal and perfusion/backbench of kidney***

- **Post op regime and care**

- o ERAS protocol (RG / KS) see appendix document
- o Thromboembolism risk assessment is low to moderate for donor nephrectomy. Patients will be given inpatient enoxaparin as per protocol not deemed as high risk to necessitate ongoing thromboprophylaxis after discharge, but this will be actively monitored
- o Facility for readmission to clean site
- o ***Formal clinical review by consultant at 24 and 48 hours post op, thereafter by indication with a plan for supported, nurse-led discharge within 72 hours.***

- **Outpatient Follow-up**

- o Telephone at 48 hours post discharge by LD coordinators

- o Contact details for 'clean site ward' / on call coordinator for issues post discharge
- o 2 weeks at clean site (NVH/ CIC) separate clinic
- o Facility for readmission to clean site

Recipient Pathway

Components of preoperative consent

- In addition to the usual pre-operative consent, we need to include consent in relation to SARS-COV-2 INFECTION-19 situation including, alternate treatment options, additional post-operative risks, the importance of pre and post-operative shielding, pre-operative testing, implications of the false negative and false positive pre-op test results and contracting SARS-COV-2 INFECTION-19 disease as nosocomial infection.
- This consent should also include an explanation of the current ever-changing situation in advice regarding SARS-COV-2 INFECTION-19 disease as new information becomes available and operation may not go ahead if the current situation changes
- In the event of a development of a complication, patients may need to stay in hospital for longer period than expected and some patients may die from their complication. Patients need to be

made aware that they will not have their family and friends visiting and supporting them during this difficult time adding difficulty for them and their family members

Enhancing patient safety

- o Inform potential live donor recipients about re-activation including option for patients to defer and/or option for patients to discuss with consultant surgeon/nephrologist prior to relisting
- o Confirm impact assessment on household contacts (current guidance requires household contacts of SOT recipients to shield) and transport arrangements (reduced ability to use public transport) in the post-transplant period
- o Shielding prior to procedure 2 weeks except for HD as currently in place
- o SARS-COV-2 PCR at final crossmatch and before admission
 - ♣ Final crossmatch
 - ♣ Review by Pharmacist / Surgeon with consent / Nurse Practitioner
- o A comprehensive social history is required, with details of the patient's social distancing practices and of those within their household, in order to build a picture to inform a risk assessment at final crossmatch.
- o Symptom screening questions prior to admission
- o Examination must include a careful chest assessment with measurement of peripheral arterial oxygen saturations.
- o If has previously contracted SARS-COV-2 patients need to be symptom free with a negative swab and imaging to confirm no lung changes (minimum 28 days from first negative swab). Clinicians via an MDT will

need to decide locally when that patient will be considered fit for surgery.

- o Admission to non-acute SARS-COV-2 site
 - ✦ In order to facilitate surgery at a site which has previously not undertaken donor nephrectomy

Tx.Coord2

- Meet recipient in am before donor surgery commences, ensure that implanting surgeon / anaesthetist are happy that patient is suitable for surgery.
 - Liaise with Tx Coord 1 and confirm that donor surgery can commence
 - Inform surgeon/ theatres of ETA once known.
 - Collect kidney in ward 4C when it arrives and sign it through the ledger then take down to theatre.
 - Check paperwork with implanting surgeon
-
- o Side room
 - o Radiological assessment of chest in line with departmental guidelines

Staff safety

- o Current PPE arrangements for any interaction.
- o Regular staff screening for early identification of asymptomatic carriers if this is adopted by through local/national policy

Post op regime and care

- o Current ward 4c protocol in place for deceased donor transplantation.
- o ERAS pathway for the following categories of patients to minimise hospital stay

(EDD day 4 post Simulect):

Living donor

Native urine output

Normal bladder

Males <60

Health literacy assessment satisfactory re medication management

Social support / transport to facilitate early clinic review or telephone follow-up

Outpatient Follow-up

- o Current arrangements for acute transplant follow-up in clean site (CIC)

Live Donor Pairs in Workup

Access to routine investigations as part of the work up process will be required to progress patients and avoid migration onto dialysis.

- o These should be streamlined as much as possible to minimise exposure to the healthcare/ hospital environment.
- o Required radiological investigations including functional studies and angiography required to be prioritised within NHSGGC

Independent assessment and HTA approval

Current completed IA assessment remains valid

New assessments need clarity of from the HTA as to whether these can happen by virtual consultation or if they must be in person

- o HTA recovery planning document (awaited) will outline practical pathways to be used.
- o Main barrier identified will be off site access to hospital IT systems to allow confidential upload to main HTA server.

Recommendations:

With appropriate MDT discussion, patient selection, , pre-op counselling / shielding (for 2 weeks), pre-op testing with PCR swab and pre-op chest imaging operations in SARS-COV-2 INFECTION-19 risk-minimised theatres/ward/hospital, and post-op shielding, we should be able to provide regional living donor nephrectomy and transplant surgery as safely as possible in the current environment.

Selective prioritised living donor kidney transplantation should resume as soon as resources safely allow.

This will require further input and liaison for the following aspects of the service

- Liaise with diagnostic radiology services and nuclear medicine services about the restart of routine radiological services required for living donor workup.
- Liaise with NHSGGC to explore possible 'clean' site for Live Donor nephrectomy surgery
- Consider the use of "off-site" 'clean' site for donor nephrectomy surgery such as GJNH or private sector site.
- Liaise with HTA as to whether IA can be performed by virtual clinic
- Regular reassessment of medical, nursing and surgical staff for symptoms and potentially regular screening tests to minimise exposure to patients of staff in an asymptomatic phase. *This is not currently undertaken and the feasibility of this should be assessed particularly if and when social distancing restrictions are eased.*
- Staffing for 'clean' site will require a designated pool of anaesthetic and surgical consultants, who may potentially need to work outside their employing trust. Appropriate governance arrangements will be required to support this, such as honorary contracts.

Appendix 1. Screening Questionnaire

Screening questionnaire for COVID19 symptoms prior to day ward attendance

Have you had any of the following symptoms in past 7 days?

	Yes	No
Fever, feeling hot, sweaty, chills		
Cough		
Sore throat		
Loss of sense of smell/taste		
Muscle aches		
Diarrhoea		
Headache		

If answer to any of these is YES, patient should be assessed as possible COVID19 infection and admitted straight to ward, SATA or COVID19 assessment area as clinically appropriate

If answer to any is YES, patient should NOT be seen on day area and should be contacted to ensure appropriate passage through hospital with mask prior to entry

