**Standard Operating Procedure for Deceased Donor kidney Transplantation (DDKT) at Evelina London Children’s Hospital during the COVID-19 pandemic**

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**1. Preoperative considerations for recipient**

**1.1 Process of patient selection and monitoring**

* Decisions for listing or relisting potential recipients will be made as part of multidisciplinary team (MDT) discussions and documented in the electronic case record. These discussions should occur every 2-4 weeks
* Similar MDM process should be carried out for new patients to join the list or returning following suspension
* In the initial phase, deceased donor transplantation will be offered to those patients considered to be at reduced risk of acquiring COVID-19 and who are expected to have an uncomplicated post-transplant course.
* Recipients who have higher risk of acquiring COVID-19 are those expected to have longer in-patient stays following transplantation, including:
  + Children whose weight is <20kg, those with cardiorespiratory comorbidity, high immunological risk, need Campath or recipients anticipated to require Intensive Care. These criteria will be reviewed.
* Immunosuppression will be prescribed according to the current immunosuppression protocol.
* Prior to listing or relisting, all patients should be screened for symptoms of COVID-19 and social and contact history before listing. **[see Appendix A for screening questionnaire before wait listing]**
* Additional testing is unlikely to be needed for patients before listing except for COVID-19 symptom screening. Any additional test will be reviewed and acted upon. For example:
  + Potential recipients with low lymphocytes will need review.
  + Patients will be monitored while on the list as per previous practice to assure fitness at all times. If there are any concerns about fitness at any time, the patient will be suspended.
* No patient will be activated until specific informed consent, that includes the risk of COVID-19, is given and documented.
* Face to face appointments will be kept to the minimum necessary. Virtual consultations will be the preferred option. When patients need to attend a clinic, they need to come with only one family member and attend a ’green area’.
* Decisions will be made on a case-by-case basis, with the advice of consultant colleagues to support collective decision-making
* Pre-Transplant Education / Preparation by Post-transplant ANP/CNS
  + Once agreed to be waitlisted virtual clinic update by post-transplant ANP/CNS. Will be vital to discuss their support needs
* Empowering patients
  + All families to be trained pre-transplant to measure home BPs and home urinalysis with revision session during transplant admission
  + Equipment needed for each individual patient detailed in ward discharge section
* Primary & secondary care support
  + Local blood tests and review is far easier if the patient has shared care set up with a named consultant paediatrician at the child’s local hospital
  + Prior to receiving transplant a named shared care consultant should be established for every recipient (referral facilitated by their lead pre-transplant consultant)
  + Patient’s renal CNS from dialysis or CKD team to investigate local community nursing team if not already known in all recipients
  + Telephone discussion to occur between member of post-transplant team and named shared care consultant and community nursing team about future support needs

**1.2**  **Patient information and consent – general principles** **[see Appendix B for details]**

* All recipients should be counselled regarding the risks of surgery during the COVID-19 pandemic and documented in their electronic records
* The available data on risk is likely to change regularly, but consent should include the potential risks of:
  1. already having asymptomatic COVID-19 prior to surgery
  2. acquiring the virus in the perioperative, post-operative or initial follow up period.
* Consent should also mention this SOP and the measures put in place at Evelina London Children’s Hospital to minimise these risks
* The clinician must discuss the following issues with the patient and parents/guardians:
  1. Explain what SARS-CoV-2 and COVID-19 are, the risks for children in general, and in the transplant population
  2. The risk of transmission of SARS-CoV-2 from the donor to the recipient
  3. The risk of the recipient developing COVID-19 post-transplant from sources not related to the donor
  4. Logistical and organisational issues, e.g. future access to operating theatres, critical care beds, ward beds, and outpatient follow-up and re-admission
  5. Risks of not proceeding to transplantation
* Advice should be given on social ‘shielding’ while on the list and post-transplant for the patient and their household.
  1. families will be updated with any new relevant information about COVID-19 and kidney transplantation especially if this may change their decision to consent.
* Once consented, NHSBT will be informed. This is a two-step process:
  1. email Clinical Transplantation Laboratory at Guy’s Hospital; and
  2. activate and suspend individual patients in the usual manner
* Where consent is not given, we will continue to offer further opportunities to discuss transplantation at further appointments.
* Guidance regarding social shielding from the government can be found at

<https://www.gov.uk/government/publications/stay-alert-and-safe-social-distancing-guidance-for-young-people/staying-alert-and-safe-social-distancing-guidance-for-young-people> and

<https://www.gov.uk/government/publications/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19>

**1.2.1 Deceased donor selection criteria**

* Every kidney offer will be discussed by the on-call transplant surgeon and paediatric nephrologist as per routine practice. In the initial phase donor kidneys that are likely to have a higher chance of delayed graft function (e.g. donor severe acute kidney injury, donor with co-morbidities) or surgical complications (e.g. complex vascular or urological reconstructions, extensive capsular tears) will not be accepted. Donation after cardiac death (DCD) donors should be discussed on a case by case basis as a young donor with short CIT may be acceptable.
* Overall, deceased donor kidneys will continue to be considered using pre-existing clinical pathways, with careful consideration of individual risks and benefits for the potential recipient.
* Deceased donor selection and COVID-19 issues.
  + All potential deceased organ donors in the UK that proceed to organ offering have nose and throat swabs and endotracheal aspirates sent for SARS-CoV-2 nucleic acid testing. A positive result precludes organ donation.
  + Negative SARS-CoV-2 nucleic acid testing does not completely exclude evolving SARS-CoV-2 infection. To date, there have been no reported proven cases of donor-derived transmission of SARS-CoV-2.
  + Consideration of organs from potential deceased donors who have recovered from confirmed or suspected COVID-19 will follow NHSBT guidance. Discussion with Trust consultant virology colleagues is mandatory if organs from such donors are considered or if there are other significant donor viral issues.

**1.3 Virology, infection control – general principles** **[see Appendix C for details]**

* These issues will be considered in the light of national guidance, after discussions with virology and infection control colleagues, and taking into account the local incidence and prevalence of COVID-19.
* In the initial phase, patients and families will be requested to shield for a 6-week period once activated on the waitlist for deceased donor kidney transplantation.
  1. guidance for shielding will be regularly re-assessed as experience with COVID-19 and prevalence of the disease changes in the community
* Definition of “social shielding” for patients waitlisted for transplantation: if a patient and family are asked to perform social shielding, this would mean family members would not be able to leave home. Parents will have to work from home and children will need to be home-schooled.
* To assess effective shielding, specific kidney transplantation screening questionnaire will be administered to the patient and their family
  1. The ability of the child and family to shield will be reviewed regularly at monthly intervals
  2. If symptomatic patient or family member tests positive for COVID-19 whilst the patient is ‘on-call’ for transplant, patient will be suspended from the waiting list for 28 days from the day of the test.
* Asymptomatic patients will undergo nasopharyngeal and throat swabs for Severe Acute Respiratory Syndrome Coronavirus-type 2 pathogen (SARS-CoV-2) nucleic acid testing. Results will be awaited before activation can proceed.
  1. testing will be repeated every 28 days
  2. No testing for COVID-19 will be performed on asymptomatic family members of the patient including parents or siblings.
  3. If Antibody testing for COVID-19 becomes available this will be performed before activation.
* At the time of offer of kidney on the deceased donor kidney transplant list.
  1. COVID-19 screening questionnaire should be carried out by the nephrologist who calls the potential recipient’s family to come in. Only one parent will be allowed to accompany the child to the hospital for transplantation.
  2. Rapid testing for SARS-CoV-2 nucleic acid testing will be performed on BOTH the asymptomatic patient and the accompanying parent. if either the patient or the parent swab is positive the transplant operation will be cancelled
  3. Rapid turn-around of COVID-19 swabs for PCR testing is required
* Following transplantation:
  1. At discharge from hospital check no one in the household has had any symptoms suggestive of COVID-19 in the previous 2 weeks. If anyone has, then patient cannot be discharged home
  2. Advise transplant recipients and their parents / carers to continue shielding post transplantation in keeping with local and national guidance
  3. asymptomatic transplant recipients will not be tested following transplantation

**2. Perioperative considerations for recipient**

**2.1 Admission pathway [see Appendix D for screening questionnaire when offered kidney]**

* Patients offered a deceased donor kidney – before coming to hospital
* Question carefully about possible COVID-19-related symptoms by telephone before considering admission for a deceased donor kidney transplant. If there are concerns about COVID-19 within the household, the patient will not be admitted.
* Following admission, the completed screening questionnaire should be reviewed by the Paediatric Nephrologist to confirm recorded information is correct. This should include comprehensive details of social distancing practices, household members, symptoms and any contacts.
* Patients offered a deceased donor kidney – after coming to hospital
  1. On admission, patient should be admitted directly into the cubicle 18, 19, 30 or 31 on Beach Ward. Cubicles 30 or 31 are preferable as they can have haemodialysis if needed in the cubicle. The recipient should undergo a rapid turn-around of COVID-19 swabs for PCR testing in addition to temperature check. The parent or guardian who will be staying with the recipient should also be swabbed
  2. If the patient or any household members are found to have had symptoms during the previous 2 weeks, or the swabs are positive, the transplant will be cancelled. The child will be suspended from the list, re-assessed and for at least 28 days in conjunction and re-swabbed after 28 days.
* Prescribe immunosuppression per current guidance
  1. No immunosuppressive medications should be given to the patient until COVID-19 swabs have been confirmed negative in both child and parent / care-giver.

**2.2 Perioperative care of recipient**

* Patients to be admitted directly into the cubicle 18, 19, 30 or 31 on Beach Ward. Cubicle 30 or 31 are preferable as they can have haemodialysis if needed in the cubicle. These rooms will be kept as clean as possible, if infected or potentially infected patients have been admitted the cubicles will be deep cleaned prior to admission.
* Conditions of the cubicle should include
  + PPE is worn by staff during patient contact.
  + No person to enter unless necessary
  + Patient and parent do not leave the cubicle until discharge unless this is clinically indicated
* Number of staff looking after the patient during admission will be minimised. Every attempt will be made to have a minimal number of nurses looking after the transplanted child during each shift and preferably the same team over the course of the admission.
* Only one parent will be allowed into hospital and once there, should stay there until discharge
* A standard perioperative care protocol will be used, including antibiotic and analgesia.
* 24/7 nephrology and surgical cover will be available as per normal
* Issues specific to recipients that need back up plans:
  + Standard immunosuppression to be used (deviations from this to be made on an individualised basis following MDT discussion with transplant team with avoidance of interventions that result in depleting antibodies)
  + Management of Rejection episodes: Decisions regarding the treatment of rejection episodes will be made on a case by case basis in conjunction with the patient and transplant team. For example, in case of vascular rejection, consider steroids instead of ATG as the first step. Management to be discussed in a small group at the time and involve the transplant team.
  + Management of delayed graft function (DGF): DGF is not uncommon in DDKT. Therefore, every attempt will be made when accepting an organ to minimise this. In case of DGF, dialysis will be provided in the patient’s cubicle by a dialysis nurse early in the morning before that nurse has had no contact with any other dialysis patients.
  + Management of different conditions in the community: Virtual meetings and photography will be utilised to avoid unnecessary admission. A course of antibiotics will be given to the family, on discharge from the ward, to take if it becomes necessary in the post-operative period (e.g. for superficial wound infection or simple UTI). This will avoid the family coming back to hospital just to pick up antibiotics. Immunosuppression should be prescribed for 8 weeks. Different strength of tablets should be prescribed where necessary to allow dose changes through telephone consultations. Adequate amounts of analgesia should be prescribed to avoid extra visits to hospital.
  + Readmission will follow the rules described above and whenever possible kept to a minimum.
  + Patient education on how to take immunosuppression will commence at the time of listing. Discussions on how to deliver medication to the recipient without asking them to come back to hospital e.g. local delivery when staying at hospital hotel, will be made in advance to avoid prolonged admission.
  + As explained above, every attempt will be made to reduce the likelihood of PICU admission, but this should be available in the unlikely case that a patient needs it.

**2.3 All methods for early discharge should be utilised with regular surgical review**

* Discussion with the family and child where possible at listing so that they are aware of perioperative plan.
* Enhanced recovery and early mobilisation with physio (out of bed on day 1, mobilise day 2).
* Ideally post-operative pain relief will be provided by TAP (transverse abdominis plane) block pre-operatively followed by continuous infusion of local anaesthetic (CILA) post-operatively, fentanyl PCA and regular paracetamol in all cases
  + CILA wound infusion to stop by day 2 post-operative. Regular paracetamol thereafter.
* Light diet on day 1, normal diet on day 2 post op
* Remove drain on day 3 or earlier
* Early catheter removal – day 4
* Aim for patient to be discharged on day 4
* At discharge from hospital check no one in the household has had any symptoms suggestive of COVID-19 in the previous 2 weeks. If anyone has, then patient cannot be discharged home
* If patient requires readmissions then they should go directly into cubicles 18, 19, 30 or 31 on Beach ward as detailed above for initial admission. Cubicle 30 or 31 are preferable as they can have haemodialysis if needed in the cubicle.

**2.4 Other considerations for early discharge**

* Primary & secondary care support
  + Post-transplant team to have discussion with GP to ascertain what support would be available
  + Paired creatinine sample with local shared care hospital by end of first month following transplantation
* Patient education during transplant admission
  + both self-management and medicine education to start with parents on Day 1 and the young person on Day 2, if old enough
  + Training or refresher with patient’s parent/carer on how to measure home BP and check urinalysis
  + More intense education with pharmacy team
  + To develop an observation sheet for the parents to fill in paper/electronic in addition to their pharmacy sheet. The family could start entering information on the ward and then continue themselves at home when they are measuring BP, temp, weights, urine dipstick.
* Family Accommodation
  + This will be an individualised decision between each family depending on their circumstances. We feel the optimal choice should be the patient and carer staying in their home and attending clinic by hospital transport or driving in their car
  + Only one parent will be allowed to accompany the child to the hospital
  + Family accommodation will be offered at Ronald McDonald House or similar. If possible transplant families should be cohorted while resident. [Details awaiting confirmation with ELCH Senior Management Team]
* Frequency of clinical review
  + Once patient is stable aim for three reviews per week with consideration for at least one of these being blood tests and then telephone review.
  + Location of blood tests and ability for tele/video consultations

**3. Post-Transplant follow up pathway for initial 3-months following transplantation [see Appendix E for details]**

* Standardisation of information given to patients and families pre-transplant
* Established shared-care set up between ELCH team and local paediatric service, GP and children’s community nursing team including individualised patient pathway for local investigations including blood tests in “cold” clinical area [defined as out-patient clinical area where only asymptomatic well patients are seen for face to face appointments with health care professionals] or at patient’s home if CCN team
* Access to 24/7 virtual review with medical and surgical team including video
* Virtual review including video available for other members of the MDT including renal pharmacist/renal dietician/renal psychologist/play specialist
* Screening questionnaire with patient/carer prior to any F2F appointment or admission to determine if seen in “cold” or “hot” clinic area [defined as out-patient clinical area where unwell or clinically symptomatic patients are seen for essential face to face appointments with health care professionals].
* Location of post-transplant clinic for face to face reviews in designated “cold” or “hot” isolation rooms
* Cubicle on ward for transplantation re-admissions
* Accommodation to continue shielding/transport for patient and carer

**4. Outcome**

* There will be a formal fortnightly audit of transplantation with data discussed with all members of the MDT
* Fortnightly review of national and international data and guidelines of transplantation in the COVID-19 era.
* Families will be updated with any new relevant information about COVID-19 and kidney transplantation especially if this may change their decision to consent.

**5. Working Group members:**

**ANP** Grainne Walsh

**Transplant surgeons** Chris Callaghan, Nicos Kessaris, Nizam Mamode

**Nephrologists**  Caroline Booth, Jo Clothier, Helen Jones, Manish Sinha, Nick Ware

**Appendix A**

**Screening questionnaire for suitability for DDKT waiting list**

1. Who lives in your home? Please list their names, ages and job title (what type of job: face to face contact). Check if they are currently working/ if they are at school or nursery.   
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1. Of the above list, please state if it would be possible for them to “shield” (this would mean that all household members would not be able to leave home and have to work from home/be home-schooled) for a defined period of time while on-call or at short notice?  
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2. What type of home do you live in (e.g. flat, house, shared accommodation etc.) and how many bedrooms are in your home?   
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3. Who else regularly visits your home? Please include all regular visitors (including other children, grandparents, friends, partners, babysitters, cleaners, gardeners etc.) and their relationship to your child.  
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4. Of the above list, please state if it would be possible for these people to stop visiting your home in order to shield the family members who live in your home:  
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5. If you were required to shield, is there anyone who can help you with this (e.g. to do your shopping, collect prescriptions etc.)? Please state any names and their relationship to your child:  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
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6. Which family member is the dedicated person who will bring your child to hospital when they receive the call for transplantation (please note that this person will be staying with the child on the ward until discharge)?

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1. If you have one child, please continue to Question 10. If you have two or more children, please answer Question 8:

During the hospital admission and post-transplant, if your child was required to be admitted to/stay for longer at the hospital for any reason, who would be available to help you with childcare? Please state any person’s name and relationship to your child:  
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1. If this was to happen, could the above stated persons self-isolate at short notice in order to protect the shielded members of your household?  
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2. What is the name of your local hospital?  
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3. Would you be happy to attend your local hospital for blood tests if required? If no, please state why not:  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
4. Does your child or any household members have any of the following symptoms or has had them in the last 2-weeks:

**Parent**

**Child**

Fever □ □

Dry cough □ □  
Sputum production □ □

Sore throat □ □

Nasal congestion □ □

Loss of smell/taste □ □  
Fatigue □ □  
Headaches □ □  
Nausea/vomiting/diarrhoea □ □  
Dizziness or light-headedness □ □  
Shortness of breath/chest pains □ □  
Strong muscle aches or pains □ □  
Sores or blisters on your feet □ □

1. Has the patient required a telephone / virtual or face to face consultation with their GP in last month? Yes /No

Was this related to any of the symptoms in Q12 above? Yes /No

If Yes: Detail

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1. Has the patient required attendance at A&E department or admission to hospital in last month? Yes / No

Was this related to any of the symptoms in Q12 above? Yes /No

If Yes: Detail

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1. Has the patient required COVID-19 swab to be taken in last month Yes / No

If Yes: Details: Result, date and location

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1. Has any family member living in the same house had COVID-19 problems? Yes / No

If yes, please explain

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1. Please list everyone your child has been in close contact (i.e. less than 2 metres for 15 mins) with over the past week?  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Have household members been shielding (i.e. not leaving the house)? Please list their names and state yes/no for each one. Please also state for how long have they been shielding.  
   \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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1. Any other issues to consider

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**Additional sources for information:**

<https://www.gov.uk/government/publications/guidance-on-shielding-and-protecting-extremely-vulnerable-persons-from-covid-19>

**Appendix B**

**Aide Memoire to support informed consent discussions around kidney transplantation during the COVID-19 pandemic**

* this is an aide-memoire for clinicians at the time of consent discussions around COVID-19-related issues for the potential recipient and their parents/guardians, and is not designed to be patient-facing
* consent discussions for living donors will need a separate document
* other (non-COVID-19) surgical / medical consent issues prior to COVID-19 are as per standard practice
* this document follows NHSBT/BTS guidance [https://nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/18300/nhsbt-bts-consent-guidance-covid-19-26320.pdf]
* discussions to take an individualised approach, in line with good consent practice, emphasising the need to give time for questions and reflections and that there are many unknowns at present

The clinician must discuss the following issues with the patient and parents/guardians:

1) Explain what SARS-CoV-2 and COVID-19 are, the risks for children in general, and in the transplant population

**Current (mid-May) data on COVID-19 in children**:

* post-transplant UK data:
  + of 1700 patients aged between 0-17 years with a functioning transplant (any organ type, e.g. heart / lung / liver / kidney) in early 2020, 3 have tested positive for SARS-CoV-2 by mid-May. None have died.
* Waiting list UK data:
  + of 170 patients aged between 0-17 years on the wait list for transplants 2020 (any organ type), 3 have tested positive for SARS-CoV-2 by mid-May. None has died.
* Current data regarding Hyperinflammatory syndrome associated with COVID-19 in children should be discussed

2) Risk of transmission of SARS-CoV-2 from the donor to the recipient

* explain relevant living/deceased donor screening pathways and tests
* explain no cases of proven donor-transmitted diseases thus far, worldwide
* one living donor liver case where donor was incubating SARS-CoV-2, still not transmitted with the liver [PMID: 32400013]
* there may still be a risk of transmission but likely to be far less than 1 in 100

3) the risk of the recipient developing COVID-19 post-transplant from sources not related to the donor

* risk of doing transplant during (asymptomatic) incubation period (and what the incubation period is)
* rationale of shielding period pre- and post-transplantation
* rationale of screening questionnaires and SARS-CoV-2 nose and throat tests prior to transplant and chances of false-negative and false-positive screening tests
* outcome data on surgery in patients during incubation period available from adults only, but possible implications of this need to be discussed. Mortality rate in adults is ~20%. No data on children following transplantation so far.
* Risk of nosocomial acquisition of COVID-19 post-transplant should be discussed with current data regarding nosocomial infection at ELCH
  + post-op PPE and infection prevention and control policies
  + plans for follow-up and shielding policies and policies on visitors / carers
  + cannot guarantee that they won’t come into contact with patients / visitors / carers /healthcare works carrying SARS-CoV-2
* how COVID-19 would be managed post-transplant and implications for the recipient and graft and immunosuppression management

4) logistical and organisational issues, e.g. future access to operating theatres, critical care beds, ward beds, and outpatient follow-up and re-admission pathways

* explanation of current pathways

5) risks of not proceeding to transplantation

* outcomes without transplantation
* risks of developing COVID-19 and the implications
* implications of declining this offer and the estimated wait for another offer, including difficulties predicting this in the COVID-19 environment (likely drop in donors for the short-term)

**Additional sources for information for clinicians:**

Link to immunosuppression management

<https://bts.org.uk/information-resources/covid-19-information/>

Link to SNOD checklist:

<https://nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/18626/frm6439-covid-19-snod-checklist.pdf>

Resources for clinicians:

<https://www.odt.nhs.uk/deceased-donation/covid-19-advice-for-clinicians/>

Data on transplants and donors:

<https://nhsbtdbe.blob.core.windows.net/umbraco-assets-corp/18674/daily-numbers-270520.pdf>

**Appendix C**

**Virology, infection control**

* 1. These issues will be considered in the light of national guidance, after discussions with virology and infection control colleagues, and taking into account the local incidence and prevalence of COVID-19.
  2. In the initial phase, patients and families will be requested to shield for a 6-week period once activated on the waitlist for deceased donor kidney transplantation.
     1. guidance for shielding will be regularly re-assessed as experience with COVID-19 and prevalence of the disease changes in the community
  3. Definition of ‘social shielding for patients waitlisted for transplantation: if a patient and family are asked to perform social shielding, this would mean family members would not be able to leave home. Parents will have to work from home and children will need to be home-schooled.
  4. To assess effective shielding, specific kidney transplantation screening questionnaire will be administered to the patient and their family
     1. Ability of the child and family to shield will be reviewed regularly at monthly intervals
     2. Results of screening questionnaires will be maintained in the patient’s electronic health records
  5. **Prior to activation on the deceased donor kidney transplant list:**
     1. Asymptomatic patients will undergo nasopharyngeal and throat swabs for Severe Acute Respiratory Syndrome Coronavirus-type 2 pathogen (SARS-CoV-2) nucleic acid testing. Results will be awaited before activation can proceed.
        1. Negative results will enable activation.
        2. Positive swabs will prevent activation on the list for at least 28 days.
        3. Following a positive swab, no repeat swabs will be performed for 28 days. At the end of this period reactivation will be considered following no concerns on clinical review, screening questionnaire and repeat negative swab.
        4. No specific tests are required to investigate for recently described hyperinflammatory disorder associated with COVID-19 in children
     2. Specific kidney transplantation screening questionnaire will be administered to the patient and their family to assess ability to shield effectively
        1. Ability to adequately shield pre and post transplantation will enable activation
        2. Concerns regarding shielding will be discussed by MDT with specific steps to mitigate risks of COVID-19 for the patient and family
     3. If Antibody testing for COVID-19 becomes available this will be performed before activation
     4. No testing for COVID-19 will be performed on asymptomatic family members of the patient including parents or siblings.
  6. **Following activation on the deceased donor kidney transplant list.** 
     1. Patients and their families will be requested to continue to perform social shielding, accepting that the strict definition may not be able to be adhered to during in-centre haemodialysis or other clinically essential interactions.
        1. In the initial phase, they will be requested to shield for a 6-week period.
        2. guidance for shielding will be regularly re-assessed
     2. All asymptomatic waitlisted patients will undergo nasopharyngeal and throat swabs for Severe Acute Respiratory Syndrome Coronavirus-type 2 pathogen (SARS-CoV-2) nucleic acid testing every 28 days
        1. Patients who are receiving in-centre haemodialysis are currently having weekly testing
     3. Kidney transplantation screening questionnaire to assess ability to shield and clinical progress will be administered every 28-days
        1. Develop electronic questionnaire for families once a week- to review progress with shielding and clinical symptoms of COVID-19
     4. There will be a low threshold for SARS-CoV-2 PCR swab testing in patients on the active transplant list who develop symptoms consistent with COVID-19.
        1. Those with proven COVID-19 will be suspended.
        2. Once suspended, patients will be considered for re-activation on the waiting list after 28 days and if they remain symptom free and clinical assessment raises no concerns.
        3. If a symptomatic family member tests positive for COVID-19 whilst the patient is ‘on-call’ for transplant, transplant patient will be suspended from the waiting list for 28 days from the day of the test
        4. Asymptomatic family members of the patient testing positive for COVID-19 will not be tested
     5. If Antibody testing for COVID-19 becomes available this will be performed every 28 days
  7. **At the time of offer of kidney on the deceased donor kidney transplant list.**
     1. Screening questionnaire when kidney is offered will be completed over the telephone before the patient arrives to the hospital [see section on admission pathway in SOP for DDKT].
     2. Only one parent will be allowed to accompany the child to the hospital for transplantation.
     3. Rapid testing for SARS-CoV-2 nucleic acid testing will be performed on BOTH the asymptomatic patient and the accompanying parent
        1. if either the patient or the parent swab is positive the transplant operation will be cancelled
        2. rapid turn-around of COVID-19 swabs for PCR testing is required to prevent risks of delayed graft function
     4. Management of the transplant recipient in an environment that poses minimal risk of COVID-19 infection is essential. [Please see section on admission pathway and Perioperative care of recipient in SOP for DDKT]
  8. **Deceased donor selection and SARS-CoV-2 issues**.
     1. All potential deceased organ donors in the UK that proceed to organ offering have nose and throat swabs and endotracheal aspirates sent for SARS-CoV-2 nucleic acid testing. A positive screening result precludes organ donation.
     2. Negative SARS-CoV-2 nucleic acid testing does not completely exclude evolving SARS-CoV-2 infection. To date, there have been no reported proven cases of donor-derived transmission of SARS-CoV-2.
     3. Consideration of organs from potential deceased donors who have recovered from confirmed or suspected COVID-19 will follow NHSBT guidance. Discussion with Trust consultant virology colleagues is mandatory if organs from such donors are considered or if there are other significant donor viral issues.
  9. **Following deceased donor kidney transplantation**
     1. Social shielding to continue in keeping with local and national guidance following transplantation
     2. Asymptomatic transplant recipients will not be tested for SARS-CoV-2 nucleic acid

**Appendix D**

**Screening questionnaire when called for offer of DDKT on waiting list**

1. Does your child or any household members have any of the following symptoms or has had them in the last 2-weeks:

**Parent**

**Child**

Fever □ □

Dry cough □ □  
Sputum production □ □

Sore throat □ □

Nasal congestion □ □

Loss of smell/taste □ □  
Fatigue □ □  
Headaches □ □  
Nausea/vomiting/diarrhoea □ □  
Dizziness or light-headedness □ □  
Shortness of breath/chest pains □ □  
Strong muscle aches or pains □ □  
Sores or blisters on your feet □ □

1. Has the patient required a telephone / virtual or face to face consultation with their GP in last month? Yes /No

Was this related to any of the symptoms in Q1 above? Yes /No

If Yes: Detail

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1. Has the patient required attendance at A&E department or admission to hospital in last month? Yes / No

Was this related to any of the symptoms in Q1 above? Yes /No

If Yes: Detail

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Has the patient required COVID-19 swab to be taken in last month Yes / No

If Yes: Details: Result, date and location

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1. Has any family member living in the same house had COVID-19 problems? Yes / No

If yes, please explain

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1. Please list everyone your child has been in close contact (i.e. less than 2 metres for 15 mins) with over the past week and have they had any symptoms?  
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2. Have household members been shielding (i.e. not leaving the house)? Please list their names and state yes/no for each one. Please also state for how long have they been shielding.  
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1. Any other issues to consider

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**Appendix E**

**Post-Transplant Pathway for new transplant recipients within 3 months of transplant in the Covid-19 era**

This guidance acts as a post-transplant pathway for paediatric renal transplant recipients in order to minimise risk to patients undergoing renal transplantation in the Covid-19 era.

**Key Points:**

* Standardisation of information given to patients and families pre-transplant
* Established shared-care set up between ELCH team and local paediatric service, GP and children’s community nursing team including individualised patient pathway for local investigations including blood tests in “cold” clinical area [defined as out-patient clinical area where only asymptomatic well patients are seen for face to face appointments with health care professionals] or at patient’s home if CCN team
* Access to 24/7 virtual review with medical and surgical team including video
* Virtual review including video available for other members of the MDT including renal pharmacist/renal dietician/renal psychologist/play specialist
* Screening questionnaire with patient/carer prior to any F2F appointment or admission to determine if seen in “cold” or “hot” clinic area [defined as out-patient clinical area where unwell or clinically symptomatic patients are seen for essential face to face appointments with health care professionals].
* Location of post-transplant clinic for face to face reviews in designated “cold” or “hot” isolation rooms
* Appropriate nursing support
* Cubicle on ward for transplantation re-admissions
* Accommodation to continue shielding/transport for patient and carer

**Prior to discharge from the ward post-transplant**

* Post-transplant team to be updated and care handed over
* Ensure parent/carer trained in home blood pressure monitoring and urinalysis testing
* Each patient provided with sphygmomanometer, tempadots/thermometer, weighing scales and urine pots/urinalysis sticks
* Vital they have a personalised medication sheet and Dossett box filled and checked by renal pharmacist
* Structured medication education programme with dates
* Confirm plan for clinic (date/time), location and that transport booked if required

**Prior to attending clinic**

* Family check sheet of screening symptoms for alerting medical team
* Recommend wearing mask/gloves for patient/families
* Medication (TTO) if required to be pre-ordered and bought to clinic to avoid patient/carer attending pharmacy (co-ordinated with pharmacy)

**Post-transplant clinic**

* The clinic area will be in a “cold” location
* To avoid other services being co-located with patients receiving post-transplantation clinic follow up
* Families to be able to access the clinic area with minimal contact with other people when walking to/from the location
* Two dedicated clinic rooms with facilities to examine patients and measure their BP available 7 days per week (same location daily)
* Area for patient and their parent/carer to wait in isolation with toilet facilities
* Blood test to take place in dedicated clean area by phlebotomy staff
* Dedicated medical and nursing cover at all times
* Medicine education sessions when required to take place in “cold” clinic area
* Post-transplant psychological support will need to be provided when required initially using available virtual clinical appointment
* Play specialist support in the post-transplant setting will need continued provision