

Organ and Tissue Donation and Transplantation

Audit of Organ Decline After Arrival of a Deceased Donor Kidney at a Primary Receiving Hospital (AUD4230)

Chris Callaghan and Lucy Newman

Full Report

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Summary

Prolonged cold ischaemia time (CIT) can damage the long-term survival of deceased donor kidneys. After an organ is explanted and first transported to a centre that accepts it (primary centre), a decision on usability cannot be made until it is inspected, and the potential recipient made ready for transplant surgery. Delays in these two latter steps can lead to subsequent organ decline or organ discard at the primary centre or other (secondary) centres.

NHSBT have not previously examined delays between organ arrivals at a centre and subsequent offer decline.

No national guidance exists on an acceptable duration between organ arrival at a transplanting centre and offer decline. It would seem reasonable to assume that UK kidney transplant centres would be able to decide on organ usability for a patient within 6 hours of kidney arrival at their centre at least 90% of the time.

This empirical benchmark was used for this audit.

This audit reviewed the duration between the deceased donor kidney being delivered to a primary receiving centre to be inspected for suitability and the time of the decline call to NHSBT Hub Operations. Please note no cases were included where the organ was accepted and proceeded to transplant without being declined by at least one centre.

Key Findings

1) From the (limited) data available, only 3/17 (18%) of the centres met the above benchmark of being able to notify Hub Operations of a kidney-only organ decline decision within 6 hours of organ arrival at the centre on 90% of occasions or more. In contrast, for SPK (simultaneous pancreas-kidney) organs 5/6 (83%) centres were able to notify Hub Operations of an organ decline decision within six hours of delivery on 90% of occasions or more.

2) Data collection and analysis were challenging due to the multiple sources and inconsistencies between datasets. A high proportion of delivery times were not available. Time and date of offer declines were difficult to determine retrospectively due to IT issues within Hub Operation's systems. These issues were a major impediment to data analysis and interpretation. If transplant clinicians feel that these issues are clinically significant and re-audits are needed, means of improving data sources will be required.

| Criteria | Expected Performance | Actual Performance |
|--|---|---|
| Time between organ arrival at implanting centre and notification to NHSBT Hub Operations if the organ is declined is six hours or less | All UK kidney transplant centres should be able to achieve this at least 90% of the time. | 18% (3/17) of centres achieved this standard for kidneys intended for kidney-only transplants |

Risk Impact Assessment

This audit relates partially to the Risk Register risk stated below. However, due to data collection issues this audit does not provide sufficient evidence to recommend changing the risk rating for these risks.

| Risk Impact Assessment | Risk Rating |
|---|-------------|
| ODT Unavailability / reduced functionality / disruption to allocation / offering system (NTxD / BPM (Business Process Management) / EOS (Electronic Offering System)) | Moderate |
| ODT Delays or errors in the process of offering organs to Transplant Centres | Moderate |

Recommendations

This report should be shared and discussed with the Chair of the Kidney Advisory Group (KAG). KAG members may wish to formally approve a national benchmark and performance target and/or recommend a re-analysis. Any decisions made by the Chair or KAG should be provided to the Clinical Audit or Statistics and Clinical Research teams to review before re-analyses.

Background

Whilst most offer declines occur before the organ is explanted, some occur after explant. When a kidney is transported to an accepting unit, it must first be inspected before a decision can be made on usability. On occasion, issues can arise with a potential transplant recipient after organ arrival that make transplantation unsafe (e.g. positive cross-match or unexpected medical conditions). It is important that centres decide whether an organ is appropriate for use for a potential named recipient in a timely manner. Delays will lead to a prolonged cold ischaemic time (CIT) and transfer the risk to other transplant centres and their patients that accept such organs.

The optimal CIT for a donation after brain death (DBD) donor kidney to be transplanted is less than 24 hours; for a donation after circulatory death (DCD) kidney the optimal CIT is less than 12 hours. After this time, long-term graft survival of the organ decreases.

It is known that some centres may occasionally have difficulties accessing theatres for transplantation, leading to prolonged organ CITs. It is not known if centres also experience difficulties accessing theatres to inspect organs, or if there is unacceptable variation in other factors that may lead to offer decline a prolonged time after organ arrival.

Given the increasing emphasis on organ utilisation within the UK donation and transplant communities it was felt timely to examine how long it takes for a receiving transplant centre to decline an offer after deceased donor kidney arrival. Please note that no cases were included where the organ was accepted and proceeded to transplant without being declined by at least one centre.

No national guidance exists on an acceptable duration between organ arrival at a transplanting centre and offer decline. It would seem reasonable to assume that UK kidney transplant centre would be able to decide whether an organ is to be used for the named patient within 6 hours of organ arrival at their unit at least 90% of the time. This empirical benchmark was used for this audit.

Rationale

On Pentana, the risks relevant to this audit are ODT Unavailability / reduced functionality / disruption to allocation / offering system (NTxD / BPM (Business Process Management) / EOS (Electronic Offering System)) (Inherent risk 20, residual risk 10) and ODT Delays or error occurs in the process of offering organs to Transplant Centres (Inherent risk 16, residual risk 12).

Aims / Objectives

- Determine if most primary accepting centres are able to assess / decline kidneys transported to them within a reasonable timeframe (six hours)
- Determine if current data collection processes enable accurate analyses

Standards

| Criteria | Expected Performance | Exceptions |
|--|---|--|
| Time between organ arrival at implanting centre and notification to NHSBT Hub Operations (if the organ is declined) in six hours or less | All UK kidney transplant centres should be able to achieve this at least 90% of the time. | There will be some exceptions to this (e.g. no access to theatres to check the organ) but this will not be able to be determined retrospectively |

Methodology

Data from the National Transplant Database (NTxD) were provided by the NHSBT Statistics and Clinical Research Team on deceased donor kidney and (simultaneous pancreas-kidney) SPK acceptances and declines during a six-month period from 12th September 2019 – 12th March 2020. These data included the time that the offer was accepted, the time of decline, and the total cold ischaemic time for kidneys and SPKs which were used in transplant.

Transport data provided by the NHSBT Commissioning Team were used to identify the date and time the kidney or SPK was delivered to the centre. The data contained no delivery information for any kidney or SPK delivered to a centre after 29th February 2020; it is therefore unlikely the data will have been impacted by the COVID-19 pandemic.

Only kidneys and SPKs delivered to centres, and then declined during this period were reviewed. This included used and not used kidneys which had been accepted as a kidney-only transplant or part of a multi-organ transplant, such as a simultaneous pancreas-kidney (SPK) transplant or a simultaneous liver-kidney (SLK) transplant. Given that pancreases and livers have far shorter CIT tolerances than kidneys, and the pancreases / livers are expected to be inspected very shortly after organ arrival, these groups were used as comparators for the kidney-only group.

It should be noted that data were provided from 18 centres in total - 12 centres provided information about kidney-only organs, five centres provided information about SPKs and kidney-only organs, and one centre provided only SPK data. Therefore 17 centres provided kidney-only data, and six centres provided SPK data as five centres overlap both groups.

The following time points were reviewed for each kidney:

- Date and time of acceptance of kidney for patient (NTxD)
- Date and time of delivery of the kidney to the transplanting centre (Transport Data)
- Date and time of decline call when the kidney is deemed unsuitable (NTxD)
- Date and time kidney is re-perfused for transplanted kidneys (NTxD)

The audit focussed only on kidneys which were declined following delivery to the primary centre, reviewing the duration between the time the kidney was delivered to centre and the time the decline call was recorded as received by NHSBT Hub Operations.

For the purposes of this audit, the outcome for each kidney was either transplanted, or not transplanted (disposed of or used for research).

Times within the dataset:

- ≤6hrs 0 minutes to 6 hours duration from delivery to decline call. Any kidneys with 0-360 minutes are included in this time category
- >6hrs 6 hours 1 minute or more from delivery to decline call. Any kidneys with 361 – 2160 minutes are included in this time category

36 hours Any kidneys with a duration of 2161 minutes or more from delivery to decline were excluded from the dataset

Where a total number of kidneys is broken down into subsets for comparison between kidneys delivered for transplants of kidneys-only and kidneys for transplants of SPKs, the following terminology will be used:

- Kidneys – organs delivered to centres intended to be used in kidney transplants containing kidney-only kidneys (which may be more than one per donation)
- SPKs – organs delivered to centres intended to be used in simultaneous pancreas kidney transplants
- Organs – kidneys and SPKs when combined to include both types; kidney transplant kidneys and SPK transplant kidneys

Error checking data

The timing of an accepted kidney offer can be altered retrospectively (e.g. when additional information is provided later) in the Hub Operations record. This would impact on the record of the date and time of the decline and on such occasions the date and time given may not reflect the true duration between the date and time of the acceptance call and the date and time of decline call. Potential error rates within the data provided are explained below. If time between delivery and notification of offer decline was more than 36 hours, these data were excluded as they were felt not to be reliable.

Errors in transplanted kidney data

Time of organ re-perfusion was compared with time of offer decline. If the time of organ re-perfusion occurred before the time of offer decline, then this was considered to be unreliable data.

Errors in non-transplanted kidney data

Because non-transplanted kidneys are not removed from ice for the purposes of transplantation or re-perfused (or at least, only in very rare circumstances where the kidney is explanted soon after transplantation), it was not possible to cross-check the time of offer decline.

Results

The original dataset contained 560 kidneys which were delivered to a centre and were subsequently declined by at least one centre before being transplanted or discarded. 384/560 (69%) cases were excluded, leaving the final dataset of 176 cases (see Table 1).

Table 1: Data included and excluded from this audit

| Data received | Kidneys | SPKs | SLK | Total |
|---|----------------|-------------|------------|--------------|
| Original dataset | 503 | 56 | 1 | 560 |
| Excluded - no delivery data | 279 | 35 | 1 | 315 |
| Excluded - declined before delivery | 49 | 3 | | 52 |
| Excluded - declined after re-perfusion | 10 | | | 10 |
| Excluded - declined >36hrs after delivery | 7 | | | 7 |
| Final dataset | 158 | 18 | | 176 |

Data were recorded on all organs offered via Hub Operations, but tracked delivery data was not reported for 315/560 (56%) cases (including one SLK) (see Table 1). At the time of this audit, there were a number of different transport providers used by centres across the UK to transport organs. Not all were required to provide tracked delivery data to NHSBT, therefore the completeness of delivery data was variable.

52/560 (9%) organs had a decline time before the delivery time. It is likely that further information became available whilst the kidney was in transit which meant the kidney would have been unsuitable for the intended recipient.

10/560 (2%) organs had a decline time recorded later than re-perfusion occurred. This suggests that transplant had taken place before Hub Operations were informed of the initial decline – likely to a different recipient.

7/560 (1%) cases had a decline time recorded which was more than 36 hours after delivery. It is extremely unlikely that an organ which has been explanted for more than 36 hours would be transplanted into a patient and it should be noted that none of these cases later proceeded to transplant. It was discovered that the timestamp changed automatically when additional information was saved to a record by Hub Operations – overwriting the original decline time. Therefore some of these cases may have been reported within the deadline but a later timestamp was applied as more information was received. The assumption was made that the times recorded for these cases were incorrect and they were excluded from the audit.

All 176 cases included in later analyses were initially declined for the intended patient, however further attempts to find a suitable recipient resulted in 65 (37%) cases proceeding to transplant. The remaining 111 (63%) organs were discarded. The breakdown by organ type can be seen in Table 2.

Table 2: Breakdown of kidney types used and not used for transplant

| Outcome of kidney | Kidneys | SPKs | Total |
|-------------------------|------------|-----------|------------|
| Used for transplant | 48 (30%) | 17 (94%) | 65 (37%) |
| Not used for transplant | 110 (70%) | 1 (6%) | 111 (63%) |
| Total | 158 | 18 | 176 |

Duration between delivery and decline of organs

The duration from delivery to decline refers to the difference between the time of the delivery of the organ to the centre which had agreed to accept the organ for that patient, until the time recorded by Hub Operations that this centre advised that they would no longer be able to use the organ.

As a pancreas remains viable for transplant for less time than a kidney, the shorter median decline time for SPKs as shown in Table 3 below, is as expected.

Table 3: Median durations for declining kidneys and SPKs

| Median decline time | ≤6Hrs (meet standard) | >6Hrs (do not meet standard) | All organs |
|---------------------|--------------------------|---------------------------------|--------------------|
| Kidneys | 2 hours 51 minutes | 8 hours 12 minutes | 4 hours 30 minutes |
| SPKs | 2 hours 4 minutes | 6 hours 33 minutes* | 2 hours 4 minutes |

*n=1

Interquartile durations from delivery to decline of kidneys and SPKs are shown in Table 4. As expected, the SPKs were declined more quickly than kidneys.

Table 4: Interquartile decline durations for kidneys and SPKs

| Time period | Kidneys (HH:MM) | SPKs (HH:MM) |
|-------------|-----------------|--------------|
| Minimum | 00:02 | 00:30 |
| Quartile 1 | 02:12 | 01:25 |
| Median | 04:30 | 02:04 |
| Quartile 3 | 07:01 | 02:59 |
| Maximum | 18:27 | 06:33 |

A comparison of centre-specific decline behaviour was undertaken to identify the duration from delivery to decline for each centre. Table 5 shows the median time taken by each centre to decline the kidney/s and/or SPK/s that they received.

Table 5: Median decline durations at each centre for kidneys and SPKs

| Centre | Kidneys received | Median time to decline kidney (HH:MM) | SPKs received | Median time to decline SPK (HH:MM) |
|---------------|------------------|---------------------------------------|---------------|------------------------------------|
| A | 2 | 03:02 | | |
| D* | 19 | 06:57 | 5 | 01:59 |
| E* | 6 | 02:12 | 1 | 06:33 |
| G* | | | 1 | 03:07 |
| H | 13 | 02:03 | | |
| I | 5 | 02:56 | | |
| J | 9 | 02:56 | | |
| K | 4 | 06:11 | | |
| L* | 24 | 04:24 | 8 | 03:14 |
| M* | 24 | 05:42 | 2 | 05:36 |
| N* | 3 | 07:08 | | |
| O | 2 | 02:55 | | |
| P | 18 | 04:57 | | |
| Q* | 1 | 06:13 | | |
| R | 4 | 03:23 | | |
| S* | 9 | 04:09 | 1 | 04:08 |
| U | 8 | 03:57 | | |
| V | 7 | 06:09 | | |
| Totals | 158 | 04:30 | 18 | 02:04 |

*centre which transplants kidneys and SPKs

Organ declines within or beyond the six-hour standard

Of the 158 kidneys, 68% (108/158) were declined within six hours of delivery to centre, leaving 32% (50/158) which took longer than six hours to be declined.

The rate at which centres declined kidneys in under or beyond the six-hour standard is shown in Table 6 for kidneys and Table 7 for SPKs.

Table 6 shows the number of kidneys declined within and beyond six hours of delivery showing the rate of adherence of each centre to the standard. 18% (3/17) kidney centres achieved the standard of declining kidneys within 6 hours of delivery to centre, 82% (14/17) kidney centres did not achieve the target.

Table 6: Kidneys declined before and after the six-hour standard

| Centre | ≤6hrs N (%) | >6hrs N (%) | Total kidneys N |
|--------------|------------------|-----------------|-----------------------|
| A | 2 (100%) | | 2 |
| D* | 8 (42%) | 11 (58%) | 19 |
| E* | 5 (83%) | 1 (17%) | 6 |
| H | 12 (92%) | 1 (8%) | 13 |
| I | 3 (60%) | 2 (40%) | 5 |
| J | 8 (89%) | 1 (11%) | 9 |
| K | 2 (50%) | 2 (50%) | 4 |
| L* | 15 (63%) | 9 (37%) | 24 |
| M* | 15 (63%) | 9 (37%) | 24 |
| N | 1 (33%) | 2 (66%) | 3 |
| O | 2 (100%) | | 2 |
| P | 15 (83%) | 3 (17%) | 18 |
| Q* | | 1 (100%) | 1 |
| R | 3 (75%) | 1 (25%) | 4 |
| S* | 7 (78%) | 2 (22%) | 9 |
| U | 7 (88%) | 1 (12%) | 8 |
| V | 3 (43%) | 4 (57%) | 7 |
| Total | 108 (68%) | 50 (32%) | 158 |

*centre which transplants SPKs and kidneys

Of the 18 SPK kidneys, 94% (17/18) SPKs were declined within six hours of delivery to centre, leaving 6% (1/18) SPK which was declined more than six hours after delivery.

Table 7 shows the number of SPKs within and beyond six hours of delivery showing the rate of adherence of each centre to the standard. 83% (5/6) SPK centres achieved the standard of declining SPKs within 6 hours of delivery to centre, 17% (1/6) SPK centres did not achieve the target.

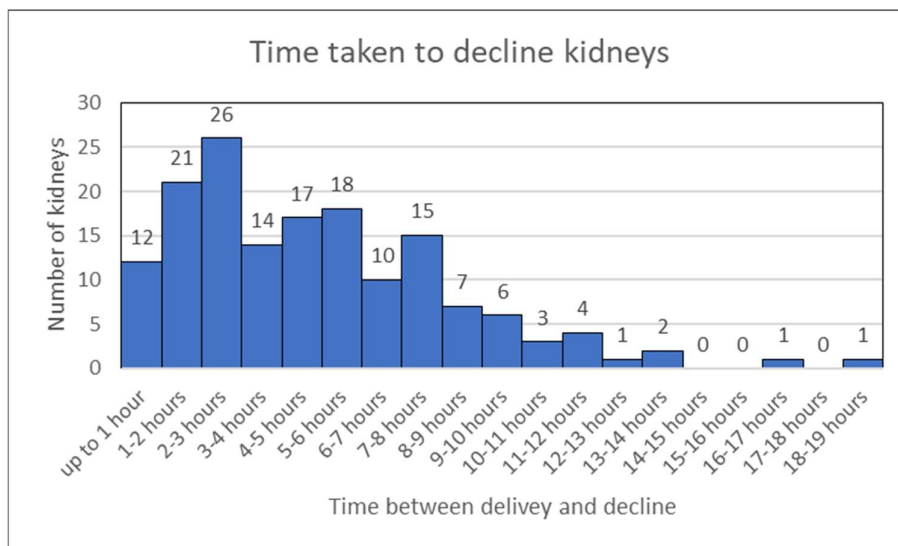
Table 7: SPKs declined before and after the six-hour standard

| Centre | ≤6hrs N (%) | >6hrs N (%) | Total SPKs N |
|--------------|-----------------|----------------|--------------------|
| D* | 5 (100%) | | 5 |
| E* | | 1 (100%) | 1 |
| G* | 1 (100%) | | 1 |
| L* | 8 (100%) | | 8 |
| M* | 2 (100%) | | 2 |
| S* | 1 (100%) | | 1 |
| Total | 17 (94%) | 1 (6%) | 18 |

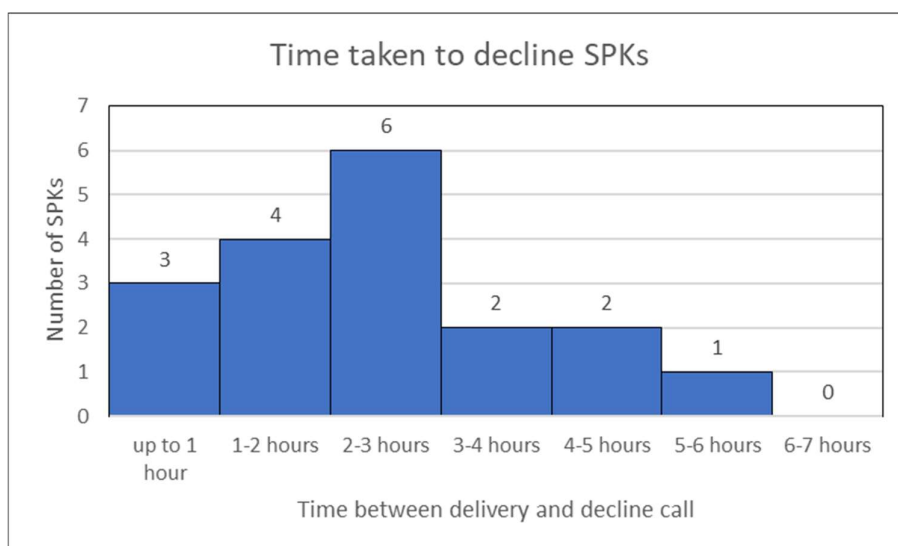
*centre which transplants SPKs and kidneys

The duration from delivery to decline call for all cases are shown in Graph 1 – Kidneys and Graph 2 SPKs.

Graph 1: Kidneys by time taken to decline



Graph 2: SPKs by time taken to decline



Organ outcomes

Although all the organs in the dataset were initially declined, some of the organs were subsequently accepted elsewhere and were transplanted (65/176, 37%).

Table 8 shows how many kidneys were declined within or outside the six hour standard and how many were later transplanted. The table shows that for kidneys that were declined within six hours, 40% proceed to transplant, decreasing considerably to 10% for those declined more than six hours after delivery.

Table 8: Declined kidney outcomes

| Kidney outcomes | ≤6 hrs | >6hrs | Total |
|--------------------------|---------------|-----------------|--------------|
| Kidneys transplanted | 43 (40%) | 5 (10%) | 48 |
| Kidneys not transplanted | 65 (60%) | 45 (90%) | 110 |
| Total | 108 | 50 | 158 |

In Table 9 it can be seen that almost all declined SPKs proceeded to transplant, whether or not they were declined in more or less than the six hour standard.

Table 9: Declined SPK outcomes

| SPK outcomes | ≤6 hrs | >6hrs | Total |
|-----------------------|---------------|-----------------|--------------|
| SPKs transplanted | 16 (94%) | 1 (100%) | 17 |
| SPKs not transplanted | 1 (6%) | 0 | 1 |
| Total | 17 | 1 | 18 |

Reasons for declining kidneys

Centres are required to provide two reasons for declining organs. The primary reason for declining organs is included in this audit. Reasons for decline fell into three broad categories, relating to issues with the organ, the recipient or logistics.

37% (59/158) kidneys and 67% (12/18) SPKs were declined for the reason of 'Other' with no further details provided.

The most common reasons for declining a kidney within six hours of delivery were Other (39%), Anatomical (16%), Organ Damaged (11%), Poor Perfusion (10%) and Recipient Refused (7%).

The most common reasons for declining a kidney more than six hours after delivery were Other (34%) were Organ Damaged (14%) Recipient Unfit (12%), Anatomical (10%) and Poor Perfusion (6%) See Table 10.

For all SPKs included in the audit, only five reasons for decline were recorded. For SPKs declined within six hours, the reasons were Other (65%), Anatomical (18%), No Theatre (6%), Not Reported (6%) and Poor Perfusion (6%). One SPK declined after more than six hours was declined for the reason Other (100%). See Table 11.

Table 10: Reasons for declining kidneys

| Reasons for declining kidneys | Kidney ≤6Hrs | Kidney >6Hrs | Total |
|---------------------------------|--------------|--------------|------------|
| Other | 42 (39%) | 17 (34%) | 59 (37%) |
| Anatomical | 17 (16%) | 5 (10%) | 22 (14%) |
| Organ damaged | 12 (11%) | 7 (14%) | 19 (12%) |
| Poor perfusion | 11 (10%) | 3 (6%) | 14 (9%) |
| Recipient unfit | 5 (5%) | 6 (12%) | 11 (7%) |
| Recipient refused | 8 (7%) | 2 (6%) | 10 (6%) |
| Poor function | 5 (5%) | 3 (6%) | 8 (5%) |
| Tumour | 1 (1%) | 3 (6%) | 4 (3%) |
| Donor unsuitable - past history | | 3 (6%) | 3 (2%) |
| X-match positive | 3 (3%) | | 3 (2%) |
| Ischaemia time too long – cold | 1 (1%) | | 1 (1%) |
| No suitable recipients | 1 (1%) | | 1 (1%) |
| Not reported | 1 (1%) | | 1 (1%) |
| Other disease | 1 (1%) | | 1 (1%) |
| Recipient unavailable | | 1 (2%) | 1 (1%) |
| Totals | 108 | 50 | 158 |

Table 11: Reasons for declining SPKs

| Reason for declining SPKs | SPK ≤6Hrs | SPK >6Hrs | Total |
|---------------------------|-----------|-----------|-----------|
| Other | 11 (65%) | 1 (100%) | 12 (67%) |
| Anatomical | 3 (18%) | | 3 (17%) |
| No theatre | 1 (6%) | | 1 (6%) |
| Not reported | 1 (6%) | | 1 (6%) |
| Poor perfusion | 1 (6%) | | 1 (6%) |
| Totals | 17 | 1 | 18 |

Key Findings

1) From the (limited) data available, only 3/17 (18%) of the centres met the above benchmark of being able to notify Hub Operations of a kidney only organ decline decision within 6 hours of organ arrival at the centre on 90% of occasions or more. In contrast, for simultaneous pancreas-kidney (SPK) organs 5/6 (83%) centres were able to notify Hub Operations of an organ decline decision within six hours of delivery on 90% of occasions or more.

2) Data collection and analysis were challenging due to the multiple sources and inconsistencies between datasets. A high proportion of delivery times were not available. Time and date of offer declines were difficult to determine retrospectively due to IT issues within Hub Operation's systems. These issues were a major impediment to data analysis and interpretation. If transplant clinicians feel that these issues are clinically significant and re-audits are needed, means of improving data sources will be required.

| Criteria | Expected Performance | Actual Performance |
|--|---|---|
| Time between organ arrival at implanting centre and notification to NHSBT Hub Operations (if the organ is declined) in six hours or less | All UK kidney transplant centres should be able to achieve this at least 90% of the time. | 18% (3/17) centres achieved this standard for kidney intended for kidney only transplants |

Risk Impact Assessment

This audit relates partially to the Risk Register risk stated below. However, due to data collection issues this audit does not provide sufficient evidence to recommend changing the risk rating for these risks.

| Risk Impact Assessment | Risk Rating |
|---|-------------|
| ODT Unavailability / reduced functionality / disruption to allocation / offering system (NTxD / BPM (Business Process Management) / EOS (Electronic Offering System)) | Moderate |
| ODT Delays or errors in the process of offering organs to Transplant Centres | Moderate |

Conclusion / Discussion

The complexity and heterogeneity of the kidney offering pathways mean that there are currently no national recommendations on expected time between an organ arriving at the primary centre and any subsequent notification of decline to NHSBT. However, it would seem reasonable to assume that six hours would give enough time for a kidney to be inspected at the implanting centre, for the potential recipient to have been prepared, and for prospective crossmatch results to be available in the overwhelming majority of cases (90% of the time).

There were limitations on obtaining accurate decline data which included tracked transport delivery times and decline time timestamping. From the available transport data, 13 centres had tracked delivery data for fewer than 10 kidneys being delivered to their centres that were subsequently declined during the audit period. If delivery data relating to all kidneys had been available, the audit could have reviewed at least 10 deliveries for all except four centres during the audit period. This would have provided a larger audit population and thus a more accurate picture of the time taken between delivery of the organ to the centre and the decline of the organ if it is found to be unsuitable for transplant at the time. It would be beneficial to capture accurate dates and times for all deliveries of all organs to transplant centres.

When additional information is provided after the original decline time, this automatically applies a new timestamp to the record, overwriting the original data. This resulted in unreliable data particularly as updates were made up to two weeks after donation. This implied that the decision to decline the organ had been made two weeks after delivery which is unrealistic. A more robust method of recording the accurate date and time of decline may be to document this information in a free-text field that is not overwritten.

The findings suggest that improvements are required in reporting all declines, with reasons in an accurate and timely way – wherever possible within six hours of the organ being delivered to the transplant centre.

Some of the recommendations from this audit can be addressed internally, others have implications for the receiving hospitals so require consideration by the Kidney Advisory Group.

Caveat

It was not possible to obtain a large proportion of the tracked delivery data, as it was not provided by the transportation companies. Decline times could be overwritten in Hub Operations when additional information was provided.

Benefits

The time between a kidney arriving in centre, being inspected by the surgeon, and the centre advising Hub Operations that the kidney is not suitable for the named patient should be no longer than six hours. This will enable timely and effective communication between Hub Operations and secondary or tertiary centres when a kidney has previously been declined for transplant. When decision-making is delayed, the ischaemic time increases, and the kidney is less likely to remain viable for transplant at other centres. Improvements made as a result of this audit will help to encourage timely decision making, leading to a higher proportion of cases proceeding to successful transplant.

Re-audit

Re-audit is recommended in 2024/2025. This would leave enough time for actions to be implemented and embedded.

Recommendations and Actions

1. The content of this audit report should be shared with the NHSBT Kidney Advisory Group (KAG) Meeting with prompts to discuss actions listed in the action plan
2. A summary of the discussion at the KAG Meeting should be shared with the audit team and outcomes should be recorded on Q-Pulse
 - a. Any recommendations from KAG on how to improve the process for declining kidneys should be provided back to the Clinical Audit Team before any re-audit
3. All transport providers should accurately record the dates and times of delivery of retrieved organs to centres for all organ deliveries and provide this information to the NHSBT Commissioning Team
4. Dates and times of the call to Hub Operations to decline the kidney should be accurately recorded. When additional information is provided later which then disrupts the record by applying a new timestamp, the original date and time of the decline call should still be available for later analysis. This may be achieved by logging a request with ServiceNow.

The action plan for these recommendations can be found on the next page

Action Plan

The following actions have target implementation dates based on the publication date of this report and the NHSBT Clinical Audit Policy. However, it is expected that all actions will be set in motion immediately and in some instances completed much earlier than the target date.

| Ref | Action | Owner | Deadline |
|-----|---|---------------------------------|-----------------------------|
| 1 | Share and discuss the content of this report with colleagues via KAG. (INC82970) | Audit Lead | 30 th June 2022 |
| 2 | Share a summary of the discussion at KAG with the clinical audit team for outcomes of discussions to be recorded on Q-Pulse. (INC82971) | Audit Lead | 30 th June 2022 |
| 2a | Any recommendations from KAG on how to improve the process for declining kidneys should be provided back to the Clinical Audit Team before any re-audit. (INC82972) | Audit Lead | 30 th June 2022 |
| 3 | Discuss and agree with all transport providers to accurately record the dates and times of delivery of retrieved organs to centres for all organ deliveries and provide this information to the NHSBT Commissioning Team. (INC82973) | Audit Lead / Commissioning Team | 31 st July 2022 |
| 4 | Dates and times of the organ decline call to Hub Operations should be accurately recorded; when additional information is provided which disrupts the record by applying a new timestamp, the original date and time of the decline call should still be available for later analysis. (INC82974) | Hub Operations | 31 st March 2022 |
| 5 | Re-audit should be added to the annual clinical audit programme for 2024-25. (INC82975) | Clinical Audit Manager | 31 st March 2024 |

List of abbreviations / glossary

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|-------------|--|
| Centre | Transplanting Hospital |
| CIT | Cold Ischaemic Time |
| DBD | Donation after Brain Death |
| DCD | Donation after Circulatory Death |
| HTA-B Form | Outcome of Organ Allocated for Transplant (Human Tissue Authority (Form)) |
| Kidney | Organs delivered to centres intended to be used in kidney transplants of kidney only kidneys (which may be more than one per donation) |
| Not Used | Organs which are not used for transplantation, but were instead used for medical research or discarded |
| NTxD | National Transplant Database |
| Organs | Kidneys and SPKs when combined to include both types of kidney included in this audit |
| SLK | Simultaneous Liver-Kidney Transplant |
| SPK | Simultaneous Pancreas-Kidney Transplant |
| SPKs | Organs delivered to centres intended to be used in simultaneous pancreas kidney transplantation |
| Used | Kidneys later used in transplantation |
| X-Match +ve | Positive Cross Match |
| ≤6hrs | 0 minutes to 6 hours duration from delivery to decline call. Any kidneys with 0-360 minutes are included in this time category |
| >6hrs | 6 hours 1 minute or more from delivery to decline call. Any kidneys with 361 – 2160 minutes are included in this time category |
| 36 hours | Any kidneys with a duration of 2161 minutes or more from delivery to decline were excluded from the dataset |