Before Admission			
Knowledge of the baby's c	ondition		
Themes	Quotes	Actions	Service improvements
Difficulty processing antenatal diagnosis  The need for clear information in this	"Was told but didn't want to believe it"  "Conflicting information carried on throughout the whole antenatal period If	Feedback to staff on real world positive and negative effect of antenatal counselling	Monthly fetal medicine MDT clinic- includes neonatologist, obstetrician, surgical nurse, midwife and paediatric surgeon
period	you are already anxious, nervous and have no idea what is going to happen, it is	Need updated parent information leaflets	Fetal medicine clinic reviewed 6 monthly
Potential for unintended consequences of knowing there may be an abnormality	"It is really upsetting to talk about it to be honest. I don't think I have processed it		Antenatal counselling- includes support information- paediatric immediate life support, practical advice
Importance of balanced antenatal discussion to managing expectations	myself yet."		Close links with family care team on NNU- meet parents, orientate to the ward, answer practical questions
			Video tour of NNU now available
The value of trust in staff by parents who need confidence in professionals	"Felt safe already, staff brilliant"  "I know someone from my hospital that was transferred here with their heart the wrong way round; so I know it is a good hospital"	Feedback to staff and the potential to roll out feedback network-wide	Family care team  Poster about good communication tips for staff- considering parent feedback
Confusion when some congenital abnormalities were not detected on antenatal scans	"We thought if anything would have been wrong, it would have shown on the amniocentesis"  "overwhelming at first'felt hysterical at first but calmed down"	Need to conduct work to determine what this group of families need to know in the immediate, short term and long-term  Consider postnatal meeting between foetal medicine and families if further explanation needed. This could include review of antenatal scans and review of performance to serve as audit	Neonatology team can link to obstetric team to meet parents for de-brief if required

Parents' general worries			
Quotes	Actions	Service improvements	
"petrified"  "didn't know what was going to hannen"	Video tour to show the rooms and incubator	Video tour of unit now done and being updated. This is shared antenatally	
alan t know what was going to happen	'Supersibs' and sibling support packs potentially useful	Neonatal operational delivery network (ODN) work stream to include videos for other units	
		Our neonatal unit podcast "Unexpected Beginnings- The Neonatal Unit". Hosted by veteran neonatal parents going through key aspects of being a parent on the neonatal unit to provide support for other parents, including an episode on 'Juggling Siblings'	
	T	In	
"I had to do all the scans on my own which I found really upsetting"  "It's like being separate families as being split up so often!"  "It was too much information to take in on your own"  "Husband felt left out and couldn't do anything"	Consider video consultations as a standard offer when a parent is unable to attend because of COVID  Consider partner in terms of ongoing bonding and long- term well-being of the child as well as parents	Regular communication and letters given to all parents in relation to any IPC issues  Families kept updated	
"scared that [baby] would get COVID-19 and she is obviously very vulnerable"  "The rules kept on changing all the time. You would ask someone questions about our appointments regarding COVID-19 regulations, and nobody really knew the	Collaborate with local, regional and national teams  Regional Q&A or FAQ as an efficient mechanism of information dissemination	Parental feedback on COVID-19 concerns and communication disseminated to all teams involved in neonatal care  Presented regionally and nationally also	
	"didn't know what was going to happen"  Quotes  "I had to do all the scans on my own which I found really upsetting"  "It's like being separate families as being split up so often!"  "It was too much information to take in on your own"  "Husband felt left out and couldn't do anything"  "scared that [baby] would get COVID-19 and she is obviously very vulnerable"  "The rules kept on changing all the time. You would ask someone questions about our appointments regarding COVID-19	"didn't know what was going to happen"  "didn't know what was going to happen"  "Supersibs' and sibling support packs potentially useful  "I had to do all the scans on my own which I found really upsetting"  "It's like being separate families as being split up so often!"  "It was too much information to take in on your own"  "Husband felt left out and couldn't do anything"  "scared that [baby] would get COVID-19 and she is obviously very vulnerable"  "The rules kept on changing all the time. You would ask someone questions about our appointments regarding COVID-19 regulations, and nobody really knew the	

Themes	Quotes	Actions	Service improvements
Parents found transfer very stressful and found it hard not to be allowed to travel with baby	"The transfer from one unit to another unit was the worst part of it all. It took a long time for the transfer to happen, but the people were lovely"	Feedback to local transport network and involve them	Members of research team are actively involved in Neonatal Operational Delivery Network (ODN) co-production work streams to include project outcomes in all work eg-transfer of surgical neonate information resources about all neonatal units in the region -align practiced regionally to reduce the variability of care across the regional NNU Working with the neonatal ODN and local neonatal transport service to help families access information and resources about transfer and the different type on neonatal
			units  Our regional neonatal transport team routinely collect feedback on care and transport experience with a quick response (QR) code on the incubators/beds. As a transfer involves care in multiple centres thi inherently collects feedback on the differences between centres. Our unit is looking into using bedside QR codes as a toc to collect timely feedback.

Supplementary Table 3. Before admission

	Admission to Hospital				
Initial phase of care	Initial phase of care				
Themes	Quotes	Actions	Service Improvements		
Appreciation for welcoming team	"to say it was a really rubbish situation it was really lovely, they were all great, understanding"	Feedback to all staff, especially nursery nurses, the very positive comments	Fetal medicine MDT workstream commenced to support service improvements- 6 monthly review meetings		
	'felt like a family'		Veteran parent volunteers back to support families		
			Metric to ensure parents spoken to in first 24 hours		
			Psychology service now in place		
			We need to reintroduce 'super sibs'- volunteer service supporting siblings on the neonatal unit		
The need more support around transitions and initial admission	"I started crying at the cot of a baby that was not mine, because I thought that was [baby]. That is how little information I had upon admission"  "I think a midwife should have taken me to	Consider an 'Induction' for new families as we do for staff. Perhaps this could be a role of the surgical liaison neonatologist  Consider video tours of the unit that are updated with any ward change with in	Welcome posters on NNU- practical information  Family care team involvement- orientation to unit etc  Named neonatologists/Surgeons		
	neonatal, that would have been very helpful; they could have then said 'this is [baby]'s mum, could someone please show her around"	future waves of the pandemic	Two neonatal consultants are now assigned as designated links to the surgical team  Communicated to midwife team to bring		
			mother on 1 <sup>st</sup> visit		
			Plan to develop photo books of the unit/equipment etc		

			"Unexpected Beginnings- The Neonatal Unit" podcast episodes on 'what is a neonatal unit?' and 'meeting your baby for the first time'
During Admission			
Themes	Quotes	Actions	Service improvements
Physical and emotional challenges will exist for all new mothers following the birth; some will be particularly vulnerable  Language barriers were addressed well. Interpreters ere offered and available but they were not always very effective. Some families preferred faster, easier and less official means	"The beads, Vcreate etc., white board were all very helpful. It was nice we could decorate the cot, it was all personal"  "young mums need a bit more support and a bit more explanation"  "I had had a C-section on a different ward and unable to go anywhere, while [baby] was going to theatre, I could not come to [baby], nobody was able to come and get me"  "Language barriers are professionally dealt with"  "Some interpreters difficult to understand"  "I would be happy with google translate sometimes"	Tailor information and advice to the specific family. We need to be aware of specific groups and characteristics that may need tailored care. These could include; 'young' mums, family that conceived through IVF, those with language barriers, families with other health needs  Feedback on interpreting services and their use. Think how best to use interpreting services; Offer translation in different ways (person/app/google) for day to day work. Need to consider information governance risks phone applications	Simple measures were very appreciated and helpful  Badgernet videos regularly utilised  Events to promote with staff on special occasions eg Mother's Day, Fathers Day, Easter, birthdays etc  Staff utilising virtual interpreting services more often in addition to face-to-face: telephone, video, google translate

Operational issues				
Themes	Quotes	Actions	Service improvements	
Importance of clear introductions and clear channels of communication	"important to have one person you can talk to, one person you are happy with, you could go to talk to and trust"  'big unit, moved rooms a lot so didn't get to know many nurses well; Was told who surgeon was but did not meet until after surgery'	Named nurses and named consultants needed (medical and surgical) and ensure the link between the neonatal and surgical teams is clear  Reminder to staff importance of introducing themselves and their role	Parents actively encouraged to attended ward round. Their attendance is recorded and audited across the service  Named consultants  Name boards at bed space for families to see  Joint neonatal and surgical ward rounds daily  Discussion with expert transport teams to develop feedback mechanisms so families can feedback on whole of healthcare journey	
Building, environment, a				
Themes	Quotes	Actions	Service improvements	
Appreciation of accommodation with the clean, spacious, private rooms nearby. This eased financial	"a life-saver"  "it's not a hotel but everything is perfect still"	Acknowledge the financial strain associated for these families	Family care team and lead oversee all aspects of parental care & support	
worries	"It is extremely expensive to have a baby	Inform planners of new building that the kitchen is very important, and parents	Family integrated care well established on NNU	
Appreciation for WIFI	admitted to LGI due to the costs around it"	need their own space within this. And note the importance of wifi to the Digital	Financial support from hospital charity for families	
Travelling and parking a common source of stress as well as the indirect expense of the admission	"Got permit for free parking but there was still not always a parking space. Drove around a lot"	Leeds project mentioned by commissioners  No easy parking solution. Perhaps promote public transport and be clear	Some meal and refreshment provision. Ability to order parent food out of hours for families transferred in	
		with parents what the parking situation is like, so they know what to expect	Families have access to hospital parent accommodation/ facilities-free of charge. Designated parent facilities-kitchen, sitting/dining room	

			Free parking permits available for families. Some designated parking spaces protected for neonatal family use
Issues with building structure and lack of privacy	"all parents could hear about our child and we knew about theirs"  "There was no natural light. I could not believe the room would be designed like this, and this was ridiculous to deprive the babies of this much light."  "The rooms are so loud, what with the building being this old, which is bad for the babies I believe."	With the planned new build, we need a mix of single rooms and open bays, private space for families and more reclining chairs  Ensure appropriate access to screens/rooms/secure environment for expressing	New screens purchased to help provide more privacy in surgical newborns area. Screens have an 'under the sea' theme to match the room décor. The screens are wall mounted between each bed space  There is a designated breastfeeding room and parent consultation room already in place for additional privacy

Supplementary Table 4. Admission to hospital

Information and Support on the NNU					
General	General				
Themes	Quotes	Actions	Service Improvements		
Information was clearly, presented, diagrams were useful	"The amount of information about the baby was enormous; Thanks to the quality of the team, I understand everything"	Encourage use of diagrams, have some standard diagrams of normal anatomy and some showing abnormalities we encounter what we can then draw on	Neonatal project work stream set up to help review and implement service improvements  Photo books planned to be developed- linking		
Parents distressed when they searched online to find	"It is difficult to understand; diagrams have solved all this; It is not the difficulty of the information	Ensure good written and web resources for	in with ODN co-production work streams		
information	that was upsetting, but the content and how rushed everything inevitably was"	parents provided or signposted	Surgical outreach signpost parents to resources/websites/charities		
	"a bad move because you only ever remember the bad stuff from those websites"		All parent information leaflets reviewed for quality of information and will be available shortly for families and staff		
Parents felt the team were always honest, even if giving bad news	"as much as I didn't want to hear it, looking back I think well, I needed to hear it. As much as it's a job for them, they're doing the best possible thing which is being honest."	Feedback to staff their candour is noticed and appreciated	Continue this care		
	"I didn't feel that they were keeping any secrets. That's sometimes what you worry about, is there something they are not telling me."				
Care felt personal	"is almost like you have the same nurse for the whole time really that you are in hospital because they all know what is going on and it is great"  "to have a bit of a giggle amid all the seriousness	Aim for consistency in staff over different shifts	Positive feedback to staff given to share feedback from families and to encourage continues good practice for supporting families		
	felt very human"		We need to review process for continuity of care from nursing team		
	"The family care team was absolutely amazing. Always present, every single day. 'Do you need this', 'do you need that'. It was brilliant"				
Feeling of being overwhelmed by having an unwell baby	"I basically said goodbye to him before surgery thinking the worst. I completely understand that they would paint the worst picture"	Prepare parents as best as possible with explanations, photos and videos	Development of psychosocial MDT underway - links with unit safeguarding nurses		

	"I never knew anything about neonatal medicine, so it was completely new"		
Some poor communication	"We never got the amount of information about the stoma we wantedNobody came to sit down with us about that procedure before it happened""  "Communication could have been better and promises should be kept: Excluded from room during precious visiting time because of procedures with other babies; procedures delayed and parents not updated as promised"  "Would like to have spoken to surgeons more, the surgeon actually doing operation we only caught by chance and we had about 30 seconds to speak to them"	We need to work on improving communication. Specific areas highlighted that we need to be aware of include:  - Anomaly screen is particularly stressful – i.e., looking for other abnormalities when one has been found  - Less information is available at weekends  - Parents sometimes too tired to take things in – need things repeating  - Hard to hear staff when wearing a mask	Better joined up MDT working to help with communication, decision making and consistent care planning including:  - Joint neonatal and surgical ward rounds Mon-Friday  - Weekly multi-professional team meeting to have holistic oversight of progress ongoing care planning  Named consultants for each surgical neonateneonatal and surgical - to lead with care, communication and decision making. Named consultants meets with family for updates  Name boards at cot-side so families know who named consultants are  Parents encouraged to attend ward rounds  Audit on parent presence on ward rounds  Nursing staff advocate for families and request meeting with surgeon/neonatologist if family request  Poster with details and picture of staff uniforms and job roles to help families understand different staff roles  Poster shared with staff with helpful 'top tips for good communication'. This was shared in Neonews (our weekly neonatal newsletter)

Conflicting information presents a large problem	"I saw 4 consultants on different days, and everybody wanted to do something"	Need to improve internal communication for consistency	As previous
	"If you change the plan every single day, how will you know if it was working or not?	If there are different opinions or the plan needs to change then we need to explain why	
	"The teams did not really communicate well. They would tell us one thing and then 5 hours later they told us they were not going to do it anymore"		
	"It was a bit cross-wired, because someone had said he had had a good night, but then it turned out he had not had a good night and was sick a lot"		
Specific			
Parents were aware of the counsellor but low uptake of	"might have been easier if it was in person. Talked to the staff instead"	Needs to be more visible and accessible	Psychology service now embedded on NNU
service	"the nurses' job is even harder now, where you have to be additional emotional support because	Nurses seen to be very supportive, but particularly important for families when isolated from other support	Hospital Chaplaincy team starting to facilitate weekly coffee morning to support families
	the parents don't have it from anywhere else"		Lots of resource posters with QR codes to help signpost families to support
			Hospital charity funds available to apply for families needing financial support
Bereavement care	"The stuff they did before X died and afterwards, it were never too much. Like we left some of his	Feedback to staff	Funding for a bereavement nurse- not in post yet
	clothes here and they posted them out to us I don't think I could have been as strong as I was if they weren't as strong as they were as well"	Encourage ongoing training with butterfly trust	Close links established with regional hospices
Vide a links are helpful in	"a Cod cond and holped us through For any	Extend the utilisation of virtual platforms to	Bereavement clinical room available
Video links are helpful in reducing anxiety	"a God-send and helped us through For any parent, mum or dad, it is the best thing"	Extend the utilisation of virtual platforms to support families	Bagdernet video diaries used frequently to connect families with their baby when not on the unit

Supplementary Table 5. Information and support on the neonatal unit

	Impact of C	COVID	
COVID-19 inform	ation		
Themes	Quotes	Actions	Service Improvements
Parents generally felt well informed and accepted the rues	"there were signs everywhere. I was told in advance when I had to get my covid test, when dad was supposed [to get his]"  "Don't really believe in Covid but accept restrictions"	Be transparent regarding uncertainty or when things have changed	Regular communication and letters given to all parents in relation to any infection prevention and control (IPC) issues
Frustration about rule			, , ,
changes	"The rules kept on changing all the time You would ask someone questions about our appointments regarding COVID-19 regulations, and nobody really knew the answer"		
COVID-19 worries	S		
Themes	Quotes	Actions	Service Improvements
The potential risk to the baby was a constant additional worry	"Covid always at the back of the mind"	Be mindful of the impact of covid and how worrying it is	The COVID-19 team at Leeds Children's Hospital provided written information
			More psychological support available
What families the	ought went well		
Themes	Quotes	Actions	Service Improvements
Feeling safe that the staff followed rules and visitors were not allowed	"tested regularly - what more could they do - Really good, doing everything"  "I did not feel unsafe at any time. I have seen the staff cleaning their hands, changing their aprons, gloves etc"	If any further waves we should be reassured our measures made parents feel safe  Acknowledge previously unrecognised	More information about testing
	"I think the pandemic made it kind of safer"	positive impact of the infection control rules eg some parents enjoy stricter visiting policies	
Frustration that there were sometimes double standards – social distancing for parents	"told off for not social distancing but then the staff were all round the work station – looks like work most of the time but not always! Didn't like that"	Staff must follow rules	Written information was created which acknowledged that rules may change over the course of the pandemic. This recognised the

but staff congregate	"It was just strange that the medical staff were not being	Be open to people pointing out	variability between centres and
around station	swabbed"	discrepancy and be able to explain or	over time.
	"There did seem to be a little discrepancy regarding family	correct	
Discrepancies between	visits"		Written information also
hospitals		Need consistency of rules between	explained that beyond COVID-19
	"We were so happy that the rules in Leeds were more lenient	different wards and units or	there are differences between
	towards that"	explanation for differences	hospitals, and it is not possible
		·	and not always appropriate for
		Comparison with other centres needs	centres to be the same
		feedback to network real time to	
		identify useful differences	Paediatric Grand Rounds provided
			a time to highlight any concerns
The restrictions caused	"Sibling only sees on facetime/photo. Doesn't talk about baby"	Nurses very engaged in helping	'Sibling packs' created to ensure
stress. Parents worried		siblings bond – positive feedback for	siblings that were unable to visit
about their other	"siblings didn't see twin before he died"	build a bear	had activities to involve them in
children not bonding			care
with the baby and	"these are Newborns the first few weeks of their lives are critical	Acknowledge impact on siblings and	
worried about the	for bonding"	offer advice	Understanding of the importance
development of the			of relatives visiting for end-of-life
baby who is only	"they learn a lot from facial expressions"	In end-of-life cases we should	care led to more visiting being
interacting with people		reconsider sibling visiting. The siblings	allowed in end-of-life care as the
hidden behind personal	"the only people who were touching her were medical staff. For	weren't able to visit a dying sibling,	pandemic progressed
protective equipment	5 weeks we did not hold our baby, which made the bond we	they had to wait until he had already	
	initially had disappear only people touching her were medical	died and was in a hospice. This seems	
	staff for interventions"	very difficult and needs addressing	
	"It must be horrible for babies to just feel rubber and plastic all		
	the time"		
	"the nurses got [sibling] a Build-a-Bear, a storybook, which was		
	brilliant, and helped us massively. [Sibling] is 5 years old. He		
	realises he has a brother, and is able to give him little presents,		
	and keeps being interested in all the updates, but has never		
	managed to see him in real life"		
Supplementary Table 6 Im		l	

Supplementary Table 6. Impact of COVID-19

Discharge					
Preparedness for leaving the unit					
Theme	Quotes	Action	Service Improvements		
		Ensure family utilise Family Integrated Care documentation re discharge planning  Consider wider family in discharge planning- utilise virtual forums for training/information  Need clear discharge criteria and communicate this to family. If discharge is 'goal based' then families will be perhaps less focussed on an agreed time that may then change  Reality of discharge different than expected – we need to work on this transition and managing expectations	Service Improvements  Multi-disciplinary discharge meetings arranged for more complex infants  Family integrated care imbedded in the ethos of care delivery.  Discharge planning document utilised  Weekly 'discharge hudddle' to discuss patient flow and what needs to be completed and any family needs, teaching, information etc plus weekly MDT ward round to highlight discharge needs.  Feedback to the neonatal surgical outreach team the positive feedback on their involvement  Extra BLS training sessions for staff so more staff able to support parental training and reduce delays on discharge  Implementation of criteria led discharge-helps manage parental expectations and reduce delays on day of discharge		
Managing bereavement of a newborn	"There is nothing I can imagine that could have helped us more than was already done for us after the baby's passing"	Continuity of care important for end-of-life care			

Adjusting to life at home Theme	Quotes	Action	Service improvements
Good follow up support provided	"in safe hands"	Continue to signpost clear	Current service review of Neonatal surgical
		communication channels for families at	outreach provision and what service needs
Re-admittance can be unexpected	"We felt prepared to go home. We just had not	home	are
and difficult - some happy if needed	anticipated that he would have to be readmitted		
to come back in, some not as	to hospital. I do not think anyone could have	Acknowledge that readmissions	Aim to improve parent contacts and
prepared as they thought	known"	emotionally difficult - need preparation	availability for specialist discharge planning and education
Many parents had built up a high	"Even now that we have been discharged, we are	Professional conversations with family	
level of trust in the hospital team,	always assured to have contact with the ward in	needed to reduce lack of trust in other	Outreach nurses go to district general
and sometimes worried about a	case something goes wrong or for more	organisations	hospitals (DGHs) to facilitate earlier
perceived lack of expertise in their	questions"		repatriation and joined up care with DGH
local hospital/ health visitor when			and tertiary centre.
home			
			DGH team invited to MDT virtually if there is
			a surgical neonate returned to local centre
The difficulty of adjusting to life at home	"We had to get used to life out of hospital. All the alarms, beeping and those noises"	Feedback to community teams	Feedback to community team
		Make time to answer all questions prior	"Unexpected Beginnings- The Neonatal Unit
Feeling isolated at home on	"It is a strange feeling to have your baby at home	to discharge	podcast episode 'Going home' explores
discharge	after long invasive support, which is why still		issues around getting reading to go home,
	having access in the community is essential"	Need to signpost sources of support for	adapting to life away from the neonatal unit,
		parents including outreach, GP, health	managing the associated anxiety and the
Appreciation for community teams	"I just have to be more careful and really watch my baby for any signs"	visitors, mental health support	role of the transitional unit in the process
	, ,, , ,		Good coordination of discharge and
	"quiet but struggling"		communication facilitates. Needs some
	. 55 5		review and improvement
	"There's always those things in the back of your		
	mind and you don't want to sound an idiot to the		
	doctors asking what if, what if, what if?"		
	"We haven't really seen anyone since we came		
	home It has just been us in our own little		
	bubble. It is difficult some days"		

Supplementary Table 7. Discharge from hospital