Improving clinician availability through reducing the number of neonatal checks; and audit of current practice.

Introduction

Part of the GP contract is to provide childhood surveillance and care, and part of this is undertaking routine baby checks.

The Healthy Child Program was started in 2009 and is a program to give comprehensive advice and surveillance on health and social care throughout a child's life[1]. It is a multidisciplinary team approach involving social care, health visitors, midwives, and the primary care team, encompassing all aspects of a child's life, allowing for the most effective care and opportunities to be offered to the family and child.

One aspect which doctors are directly involved in is the baby check. This is essentially a gross screening examination for any anatomical or neurological or developmental abnormalities. It is a comprehensive examination, and there is a clear checklist of what should be examined and documented.[2,3] Most Surgeries, including our own have a template to remind us to undertake all the necessary steps. The whole process takes around 15 – 20 minutes, including initiating the consultation, having the parents undress and ready the baby, redressing the baby and documenting the findings.
The first routine test takes place within the first 24 hours of birth, almost always by a hospital doctor or practitioner. It would be very rare for a general practitioner to have to undertake this initial examination; the only possible circumstance would be if it was an uncomplicated home birth. However, in recent years it has become mandatory to input the findings into the NIPE (Newborn Infant Physical Examination) online tool, which is a national database, of which GPs do not generally have access to.

One controversy of the Healthy Child Program is the frequency of the examination.
The guidance from NHS England, and Derby and Derbyshire Local Medical Committee (LMC) is not particularly clear and is open to interpretation, with some practices interpreting the guidance that a routine newborn check is required at 2 weeks of age, while others omitting this check, and performing only the 6 – 8 week neonatal examination.

Reasons for choice of quality improvement project

Avenue House has historically taken advice for Derby and Derbyshire LMC regarding the 14 day check, and had been advised to continue to provide this service.
Avenue House and Hasland Partnership (at the time of the audit) is a large two site practice with around 13500 patients, and has an average of 132 births per year (averaged over the preceding three years)
During the early stages of ST3 placement, it was noted the practice policy is to undertake day 14 neonatal examination, which is often undertaken by registrars as they often have greater availability of double appointment slots. During a previous paediatrics rotation there was never any mention of undertaking a two week check, only ever mention of a 6 – 8 week check with the GP.
While performing baby checks is an important part of the routine care of the child, it is not strictly necessary, nor often helpful to perform the check at two weeks of age, a short time since having initial baby check in hospital. It can be estimated that each GP appointment in England costs on average £22.60 - £45[4,5,6] so each appointment saved could have a potential cost saving.
Each baby check takes a double appointment for usually a well child. It was not known in the practice how many appointments per year were spent performing neonatal examinations and if there was any benefit, nor did the practice know what percentage of patients were having their routine 2 week examinations performed.

Methodology

There was a three part approach to implementing and measuring outcomes;

Part 1 – steps taken to review current practice policy and comparison to other practices in the CCG, in order to stop performing routine day 14 neonatal examinations.

Part 2 - Audit of electronic records of babies born three months before and three months after cessation of routine day 14 neonatal examination. Analysis of documentation of neonatal examination, number of appointments saved, potential clinician time saved and analysis of potential harms.

Part 3 Qualitative semi structured interview of administrative staff including estimated average time spent per week organising and chasing patients for neonatal check, change in use of resources and reasons for non completion of neonatal examinations pre and post intervention.

Part 1

A meeting was set up with the practice manager to discuss the issue. It was noted that there had previously been multiple discussions on this issue, most recently in 2015, where it was taken to the local CCG and LMC meeting. The outcome at the

time was that day 14 neonatal checks were mandatory and part of the core contract so the practice continued at that time.
The practice manager agreed to take it forward to the practice partners meeting. It was discussed at partner's meeting on 08/11/17 and no conclusion was reached. It was agreed that the practice manager would take the issue to the practice manager's meeting.
At practice manager's meeting it was discussed and of all the practices in the CCG, Avenue House Surgery was only one of two practices who undertake routine 2 week baby checks. It was then agreed that these could therefore be ceased on a consensus basis.

Part 2

Systematic procedures for two week neonatal check were ceased on 01/12/2017.
Electronic records of patients born three months before intervention and three months after intervention were audited for review.

A Systmone search was set up and ran twice; creating a list of all babies born three months prior to cessation of two week neonatal checks – from 1st September 2017 to 30th November 2017.
A second list of births from 1st December 2017 to 28th February 2018 was created.

Data was extracted and analysed from both groups.
In both pre and post intervention groups, a brief review of each electronic record was conducted to review the adherence to the policy. Data extracted included;

- Number of patients born in each three month period

For both day 14 and 6 – 8 week neonatal examination;

- Documentation of completed neonatal examination
- Age at documentation of neonatal examination
- Reason if neonatal examination not performed (if known)
- Documentation of normal or abnormal examination
- Any action taken

Part three

A brief semi structured interview of administrative staff responsible for ensuring neonatal examination appointments are booked. Questions were open and referred to before and after the cessation of day 14 neonatal examination. Questions included;

- Number of hours per week organising routine baby checks
- Costs to the practice in terms of resources; stationary, postage etc
- Typical reasons for non completion of checks
- Changes in workload pre and post intervention

♦ Results

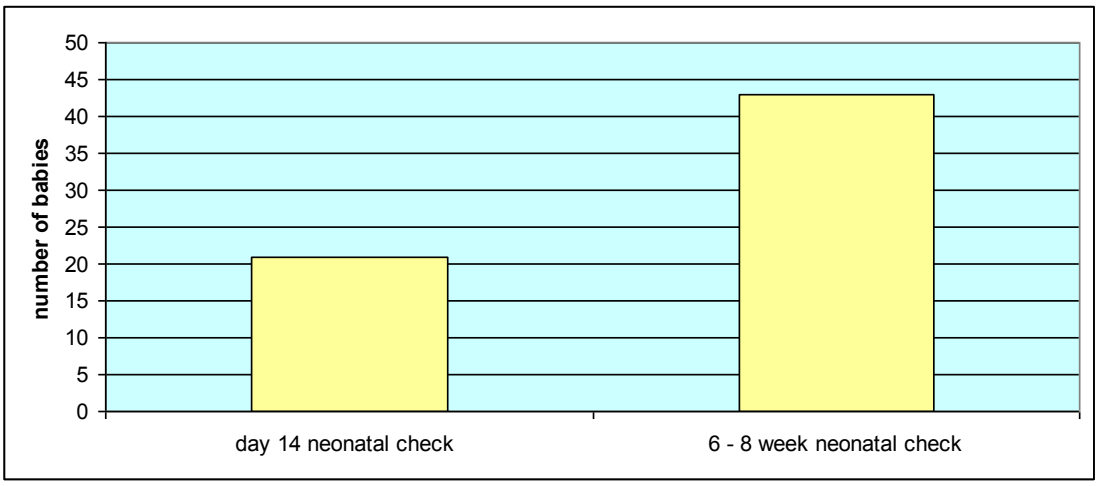
Results Part i)

Day 14 neonatal examinations were ceased on 01/12/2017.

Results Part ii)

In period 1; 1st September 2017 – 30th November 2017 there were 43 births.
In period 2; 1st December 2017 – 28th February 2018 there were 26 births.

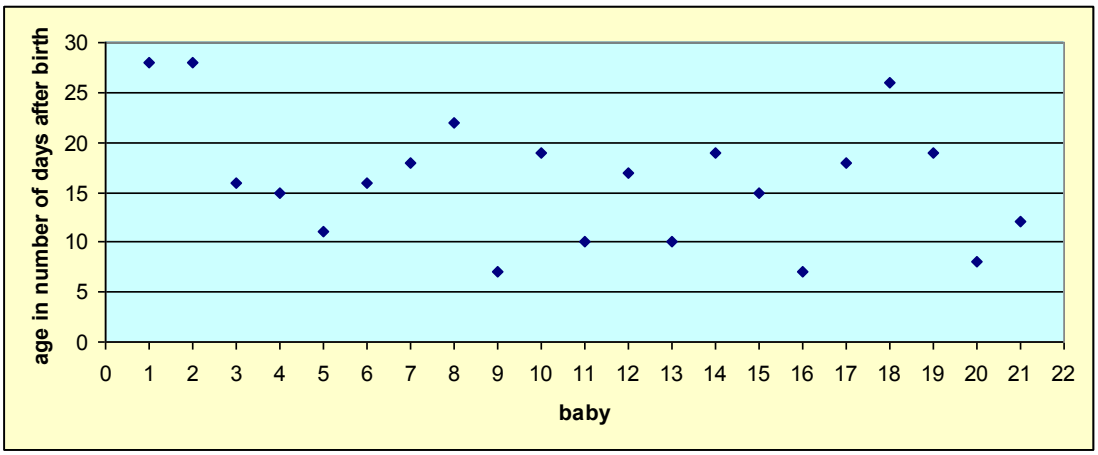
Period 1



Graph showing the number of completed neonatal examination of babies born in period 1.

21/43 or 49% of babies had the day 14 neonatal examination performed.
42/43 or 98% of babies had the 6 – 8 week neonatal examination performed.

Day 14 neonatal check



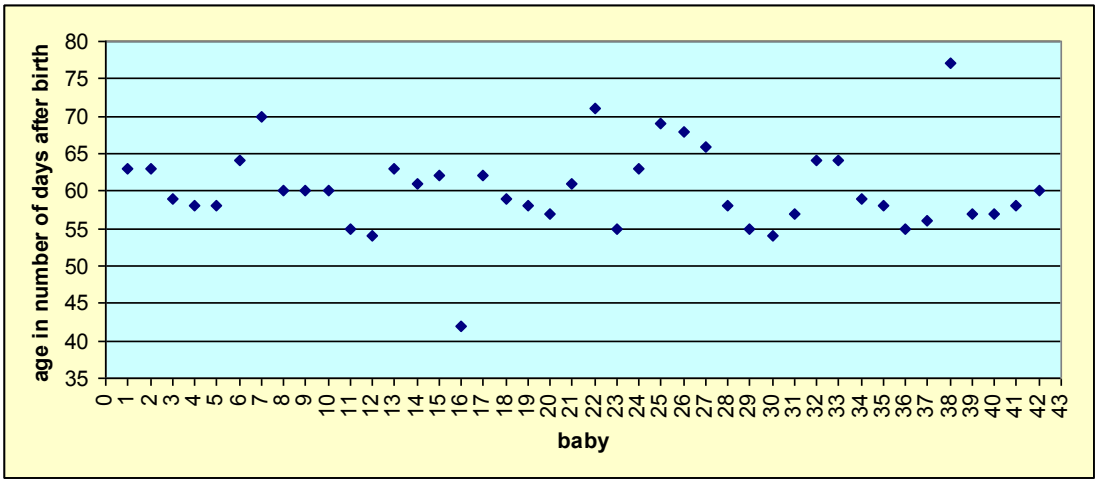
Scatter plot showing age in number days when each day 14 neonatal check was carried out.

For the initial day 14 neonatal check the range of age in number of days was 7 days to 28 days. The average age at neonatal check was 16 days.

Of the 21 babies who had the examination, at the initial data gathering step, there were only two where there were documented reasons for the check not being carried out. The reasons for non completion became clear upon interview of administrative staff.
One baby was a premature labour and had a prolonged hospital stay.
One baby DNA'd the appointment.

No neonatal examinations were marked as abnormal.
From the neonatal examination, no medical actions were taken.

<u>6 – 8 week neonatal check</u>



Scatter plot showing age in number of days when each 6 – 8 week neonatal check was carried out.

For the 6 – 8 week neonatal examination, the range of age in number of days was 42 (6 weeks) to 77 days (11 weeks)
The average age was 60 days (8 weeks and 4 days.)

42/43 babies had the 6 – 8 week neonatal check. The one baby who did not had a prolonged stay in hospital. It is unknown whether or not this baby had the check performed in hospital.

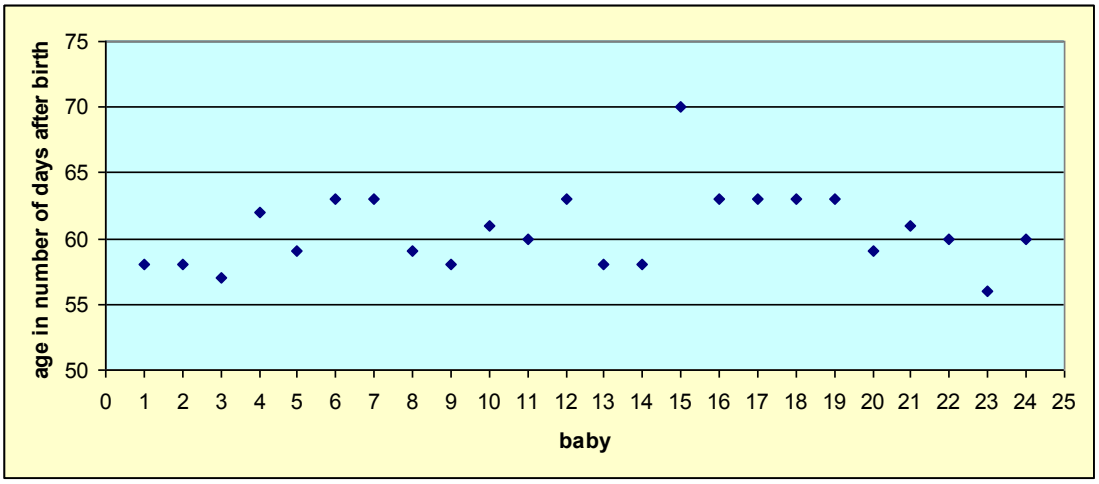
No neonatal examinations were marked as abnormal.
Of the 42 babies who had the neonatal check, five had specific medical actions taken, of which four needed only minor actions taken.
Actions taken included;
One baby prescribed gaviscone for reflux
One baby prescribed saline nasal drops for nasal congestion

One baby prescribed saline nasal drops for nasal congestion and aqueous cream for dry skin
One baby had fever associated with minor illness and it was recommended to defer the baby's immunisations – which commonly takes place just after the routine 6 – 8 week neonatal examination.

One baby required major action – they had faltering growth and were initially monitored with the health visitor, soon after the baby was referred to the paediatric clinic in view of this.

Period 2

0% of the babies in period 2 underwent a day 14 neonatal examination.
23/26 or 88% of the babies in period 2 underwent a 6 – 8 week neonatal examination



Scatter plot showing age in number of days when each 6 – 8 week neonatal check was carried out.

For the 6 – 8 week neonatal examination, the range of age in number of days was 56 (8 weeks) to 70 days (10 weeks)
The average age was 60 days (8 weeks and 4 days.)

Of the three babies which did not have the examination completed, two had a prolonged stay in hospital due to prematurity. It is not known if this baby had a 6 – 8 week neonatal examination.
One baby DNA's the appointment.

Of the 23 neonatal examinations completed, one was marked as abnormal, and three further babies had medical actions taken. The baby marked as abnormal was referred to paediatrics with a heart mumur and plagiocephaly.
Of the other three babies, one had gaviscone prescribed, one had lactulose prescribed for constipation and one had increased health visitor weight monitoring.

Results Part iii)

A brief semi structured interview of administrative staff responsible for ensuring neonatal examination appointments are booked.
The semi structured interview took place on 05/04/2018, after both periods had been completed.

Number of hours per week organising routine baby checks;
Before cessation of day 14 check; "3- 4 hours per week"
After cessation of day 14 check; "1 – 2 hours per week"

Costs to the practice:
"No change in cost of stationary or postage. Usually day 14 postnatal checks are organised by telephone due to the short amount of time of babies being discharged and requiring neonatal examination. "

Typical reasons for non completion of check;

"Lack of communication from hospitals and patients. Births are notified to the GP practice by post via a small carbon copy of a form from the hospital. This can be received up to six weeks after the birth, longer if there has been a long stay in hospital.
The only other way the practice finds out of the birth is if the parents come in to register the baby – which isn't high on new parents' priority list.
Often the practice receives notification of the birth several weeks after, when the window to contact the parents to arrange the initial check has passed. It can be already too late to try and organise an initial neonatal examination, so we proceed straight to invitation of immunisations and 6 – 8 week check."

Changes in work load pre and post intervention;

"It was pretty stressful trying to organise the day 14 check. I spent a lot of time on the phone trying to contact patients, who are often reluctant to come in. When there isn't much time to organise the checks, it can also be really difficult to find double appointment slots, especially when some registrars can't do the checks. This can causes further delays. The actual amount of time I spend a week is really variable, it depends on how many notifications we have in the week.

It's been much better not having to chase after parents to arrange the day 14 check, much less stressful. There is still a fair amount of work in setting up the immunisations and 6 – 8 week check, I also create the systmOne records for the new babies which takes time.
I've got much more time to spend on my other duties in the practice now that I'm not forever chasing up parents."

Evaluation and discussion

Discussion

Reduction in annual number of clinical appointments saved by extrapolation of data

There is a notable difference in the number of births between the two periods; 43 vs 26, so they cannot be compared like for like. This is likely due in part to natural random variation, plus typical yearly variation, where on average there tends to be more births between July – October.

Determining the exact number of appointments saved depends on how the data is analyzed. In absolute numbers, there were 21 day 14 neonatal check carried out in period one. If none of these had taken place, then 42 (21 double appointments) were saved. This is the equivalent to 7 hours clinical time.
If all 42 babies (excluding the one baby who was had an extended hospital stay) had been registered in a timely fashion, and every neonatal examination performed – this would be a reduction in appointments of 86 (43 double appointments) during period one. This is equivalent to 14 hours 20 minutes clinical time.
For period two, none of the 26 babies had a day 14 neonatal examination, so that is an absolute reduction of 52 (26 double) appointments – equivalent to 8 hours 50 minutes of clinical time.
The data can be extrapolated for an entire year; the average number of births over the preceding three years was 132.
Upon audit of period one, 49% of babies had a day 14 neonatal examination.
Therefore the potential number of appointments saved over 1 year could be 264, or taking an average number of babies undergoing day 14 examination; 49% of 132 = 129.

	Total potential number of appointments saved (if all checks completed)	Equivalent clinical time		Actual potential number of appointments saved (49% of total births)	Equivalent clinical time
Period 1	86	14 hours 20 minutes		42	7 hours
Period 2	52	8 hours 40 minutes		25	4 hours 20 minutes
1 year	264	44 hours		129	21 hours 30 minutes

Summary of data captured from audit and extrapolation of data for total 1 year savings.

Data audit pre and post intervention

There is a large age range at which day 14 neonatal examination were undertaken. If this was target driven, then this would be an area of poor performance.
Secondly, less than half of babies were undergoing examination, so babies were having unfair access to care, through systematic delays.

Potential harms

Audit of the data revealed that no day 14 neonatal examinations were marked as abnormal and no actions were taken upon routine day 14 neonatal examination. There are, however, too few data points to determine with statistical significance that no harms occurred.

Administrative workload related to day 14 neonatal examination

There is potentially a large decrease in number of administrative hours saved per year. Before the intervention; estimated 3 – 4 hours per week was spent organising and chasing parents for examinations. The can be extrapolated over a year to 52 multiplied by 3 to 4 hours = 156 to 208 hours per year.
Post intervention; estimated 1 – 2 hours per week – over 1 year = 52 – 104 hours per year.
This shows a large difference in the administrative time spent organising an examination of unclear significance and necessity.
Secondly, improving the work life of staff has been positive also, with a reported reduction in stress levels post intervention.
The semi structured interview also revealed the reasons for non completion of examinations – the delay in transfer of information from secondary care to primary care. This suggests that the system for notifying primary care of births is outdated, and is not timely or robust.

Evaluation

Other potential benefits of the intervention

Fairer access to healthcare, no patients are missing examinations due to mainly logistical reasons.
Better care for new parents – attending for an unnecessary appointment during the first few weeks of having a new baby can be stressful, at a time when care demands are at their highest, and often sleep of parents is at its most limited.

Cost saving. While it is difficult to cost exactly how much each baby check costs, it can be said with reasonable confidence that there is a significant saving likely to be made by freeing up time for other clinical activities. One estimate suggests that each GP appointment on average costs the NHS £22.60 - 45. IF we assume a total of 129 appointments were saved, this equated to a cost saving of £2915.40 - £5805.

Furthermore, the saving in administrative time can now be spent performing other administrative responsibilities.

Shortfalls of the Quality Improvement Project

The difference in the number of births in the two periods made it not possible to compare the data sets like for like.
The data for an entire year of neonatal checks could be audited pre and post intervention. This would be more likely to have a lower difference in number of births in each period. Alternatively, the same three month period could be audited the following year, which would take into account typical seasonal variation. A further alternative would be to define the number of patients to audit, rather than a given time period.

The semi structured interview provided qualitative data which is does not readily fit into "SMART" criteria. However the qualitative data is useful as it provided information on working patterns. The saving in admin time could be formalised by recording the time spent each week on organising neonatal examination, however this is probably unreasonable to enforce on members of administrative staff.

Conclusion and suggestions for further development

This intervention has saved a large number of clinical appointments and decrease in the number of hours of administrative time spent on a task.
Audit of the notes revealed how low the completion rate of day 14 neonatal examination was, and also that no action was taken suggesting that cessation of the routine check is unlikely to result in harms.
Semi structured interview has revealed a systematic problem of slow notification of births to primary care.
Further development could entail building improved lines of communication between primary and secondary care, specifically in notification of births. Although day 14 neonatal examination are not being carried out, delays in notifications of births can potentially delay important clinical information which may be relevant during clinical appointments for other reasons. It is recognised that this would not be a small project, reliable lines of communication between primary and secondary care are very variable between secondary care departments.

Critical Reflection

I found this quite a satisfying piece of work. It was rewarding identifying an area which I would like to improve, rather than having a quality improvement project suggest to me to undertake. I find it frustrating working with systems where there are inefficiencies – where a change could be implemented fairly effectively.
It has allowed me to update my audit skills and improve my ability to efficiently audit notes – it is very likely that in my future career I will be expected to contribute to

quality improvement, and as one of the most common tools of quality improvement is clinical audit.

As always in raising a question and undertaking an intervention, further questions are raised. Initially the intervention was not looking at the percentage of early neonatal check undertaken, however early in the review of electronic records it became clear that this was a significant problem and so was included in the analysis.

As I am developing as a clinician, my career goals are constantly changing. Earlier in my training career, my aim was to complete training and work in a salaried role, go to work, see patients, and do my clinical work generated from the patients I have seen. Now however, I can see how contributing to quality improvement is not only necessary but also rewarding. It's also shown me that quality improvement doesn't need to be complex, or just completing an audit cycle, but can be simple, and if well thought out, small changes can really make an impact on an organisation. If every member of the team is involved in quality improvement, lots of small improvements can make a big difference to an organisation.

I needed to work as part of the team to implement this change – meeting with the practice manager who in turn took the suggestion to the winder partner team, and ultimately took the suggestion to CCG level, in raising it with the CCG practice managers meeting. Once a date was established for the change, the data audit and analysis was undertaken by myself. Perhaps in a future quality improvement project, I could aim to lead on a project with one or more members of staff, to continue my leadership development.

References

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Appendices

Period 1 Data

Period 1	location	PNC 2 weeks	normal Y or N	reason for not doing prolonged	weeks after birth		PNC 6 - 8 weeks	weeks after birth	days after birth	normal Y or N	action taken	action
1	Hasland	N		hospital stay	n/a		N					
2	AHS	Y	Y		4	28	Y	9	63	Y	N	
3	AHS	Y	Y		4	28	Y	9	63	Y	N	
4	AHS	Y	Y		2.2	16	Y	8.4	59	Y	N	
5	AHS	Y	Y		2.1	15	Y	8.3	58	Y	N	
6	Hasland	N		unknown	n/a		Y	8.3	58	Y	N	
7	Hasland	Y	Y		1.5	11	Y	9.1	64	Y	N	
8	AHS	N		unknown	n/a		Y	10	70	Y	N	
9	AHS	N		unknown	n/a		Y	8.4	60	Y	N	
10	AHS	N		unknown	n/a		Y	8.4	60	Y	N	
11	AHS	N		unknown	n/a		Y	8.4	60	Y	N	
12	Hasland	Y	Y		2.2	16	Y	8.1	55	Y	N	
13	AHS	N		unknown	n/a		Y	7.6	54	Y	Y	canesten groin rash
14	Hasland	N		unknown	n/a		Y	9	63	Y	N	
15	Hasland	N		unknown	n/a		Y	8.5	61	Y	N	
16	AHS	Y	Y		2.4	18	Y	8.4	62	Y	N	
17	AHS	N		unknown	n/a		Y	6	42	Y	N	

18	AHS	N		unknown	n/a			Y	8.6	62	Y	N	
19	AHS	Y	Y			3.1	22	Y	8.3	59	Y	N	
20	AHS	N		unknown	n/a			Y	8.2	58	Y	N	
21	AHS	N		unknown	n/a			Y	8.1	57	Y	Y	gaviscone
22	Hasl and	N		unknown	n/a			Y	8.5	61	Y	N	
23	AHS	N		unknown	n/a			Y	10.1	71	Y	N	
24	AHS	N		unknown	n/a			Y	7.6	55	Y	N	
25	Hasl and	Y	Y			1	71	Y	9	63	Y	N	
26	AHS	Y	Y			2.5	191	Y	9.6	69	Y	N	
27	Hasl and	Y	Y			1.3	101	Y	6.5	68	Y	N	
28	Hasl and	N		unknown	n/a			Y	9.3	66	Y	N	
29	AHS	Y	Y			2.3	171	Y	8.2	58	Y	N	
30	Hasl and	Y	Y			1.3	101	Y	7.9	55	Y	N	
31	Hasl and	Y	Y			2.5	191	Y	7.8	54	Y	N	
32	AHS	Y	Y			2.1	151	Y	8.1	57	Y	N	
33	Hasl and	Y	Y			1	7	Y	9.1	64	Y	Y	** faltering growth monitor with HV
34	Hasl and	N		unknown	n/a			Y	9.1	64	Y	N	
35	AHS	Y	Y			2.4	18	Y	8.3	59	Y	N	
36	AHS	N		DNA'd appt	n/a			Y	8.2	58	Y	Y	saline drops for nasal congestion
37	AHS	Y	Y			3.5	26	Y	7.9	55	Y	N	

38	Hasland	N		unknown	n/a		Y	8	56	Y	N		
39	Hasland	N		unknown	n/a		Y	11	77	Y	Y	fever - defer IMMs	
40	AHS	Y	Y			2.5	19	Y	8.1	57	Y	Y	aqueous cream and saline drops
41	AHS	N		unknown	n/a		Y	8.1	57	Y	N		
42	Hasland	Y	Y			1.1	8	Y	8.2	58	Y	N	
43	AHS	Y	Y			1.5	12	Y	8.4	60	Y	N	

Period 2 data

Period 2	6 - 8 week postnatal check	weeks after birth	days after birth	normal Y or N	action taken	action
1	Y	8.2	58	Y	N	
2	Y	8.2	58	Y	N	
3	Y	8.1	57	Y	N	
4	Y	8.6	62	Y	N	
5	Y	8.3	59	Y	Y	lactulose for constipation
6	Y	9	63	N	Y	heart murmur and plagiocephaly refer to paeds
7	Y	9	63	Y	N	
8	Y	8.3	59	Y	N	
9	Y	8.2	58	Y	N	
10	Y	8.5	61	Y	N	
11	Y	8.4	60	Y	N	omeprazole and observe only
12	Y	9	63	Y	N	
13	Y	8.2	58	Y	N	
14	Y	8.2	58	Y	N	
15	Y	10	70	Y	N	

16	Y		9	63	Y	N	
17	Y		9	63	Y	N	
18	N	-	-	-	-	-	prolonged hospital stay
19	N	-	-	-	-	-	prolonged hospital stay
20	Y		9	63	Y	N	
21	Y		9	63	Y	N	
22	Y		8.3	59	Y	N	
23	N	-	-	-	-	-	DNA'd
24	Y		8.5	61	Y	N	observe weight with HV
25	Y		8.4	60	Y	N	
26	Y		8	56	Y	N	