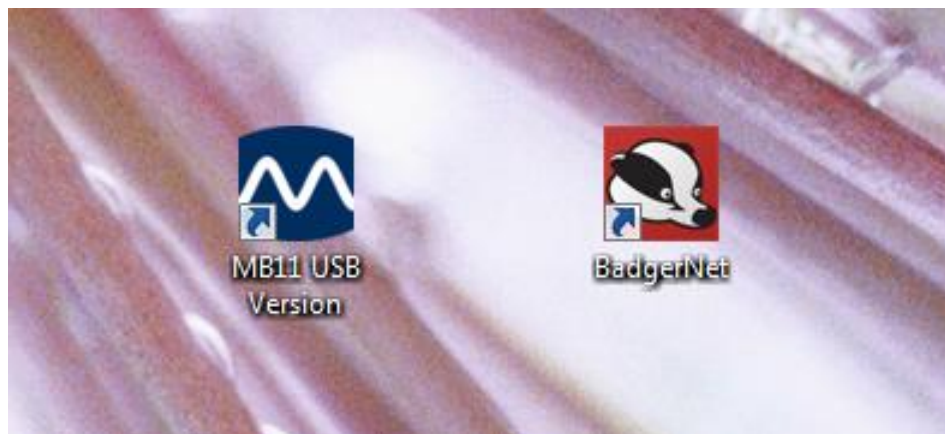


# Universal Newborn Hearing Screening and Early Intervention Programme



## **NHIMS** **From manual to electronic**

June 2015





# Universal Newborn Hearing Screening and Early Intervention Programme



## Quality focus 'the search for continuous improvement'

**NSU Quality Principle 6:**  
National screening programmes are committed to quality  
improvements in programme management and clinical service  
delivery.

Review of Newborn Hearing Screening Regimes and  
Associated Devices, March 2014 - 3 recommendations

Quality improvement review of a  
screening event in the UNHSEIP, Dec  
2012 - 21 recommendations

UNHSEIP Monitoring Reports

UNHSEIP audit programme



# Universal Newborn Hearing Screening and Early Intervention Programme



## Three main areas of change to the programme

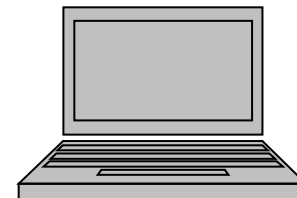


1. One type of equipment for all newborn hearing screening

2. New testing regime and protocol, including hearing surveillance



3. A new national information system for hearing screening and babies referred to audiology





# Universal Newborn Hearing Screening and Early Intervention Programme



## Timeline for changes

- 30 March 2015 was the beginning of the training on equipment and protocol
- 17 June 2015 – 13/20 DHBs have participated in training for new regime and equipment
- ~70% of babies nationally are being screened under the new regime
- By 21 August all DHBs will have implemented aABR only screening
- *NHIMS will take a bit longer to be implemented – will begin in July 2015*



# Universal Newborn Hearing Screening and Early Intervention Programme

## How is information currently managed?

Paper screening form

- 30% electronic data transfer
- 70% manual data entry



**Universal Newborn Hearing Screening Programme**

**Patient Information**

NIH No: \_\_\_\_\_ Date of Birth: \_\_\_\_/\_\_\_\_/\_\_\_\_

Last Name: \_\_\_\_\_

First Name(s): \_\_\_\_\_ Delivery Location: \_\_\_\_\_

Gender: ☐ Male ☐ Female Public ☐ Private ☐ Home ☐

Gestational AGE: \_\_\_\_\_ Wks Weight: \_\_\_\_\_ g Time of Birth: \_\_\_\_\_

Multiple Births: ☐ YES Order: \_\_\_\_\_ of \_\_\_\_\_ ORB: \_\_\_\_\_

Protocol: ☐ Well Baby ☐ NICU / SCBU for more than 48 hours

Delivery Site: \_\_\_\_\_ Transferred to Location: \_\_\_\_\_

**Consent**

Consent Given: ☐ YES ☐ NO Privacy Notification Seen: ☐ YES ☐ NO

**Risk Factors for Hearing Loss**

☐ Family History ☐ Cranio-facial anomalies ☐ Head Trauma ☐ Bacterial/Metal Meningitis ☐ Syndrome ☐ TORCHUS

☐ Intrauterine Phenytoin ☐ Intrauterine Transfusion ☐ Hypoxia ☐ NICU more than 5 days ☐ Other \_\_\_\_\_

**Contact Details**

Last Name: \_\_\_\_\_ Relationship to Baby: \_\_\_\_\_ Home Phone: \_\_\_\_\_

First Name: \_\_\_\_\_ Mobile Phone: \_\_\_\_\_

Home Address: \_\_\_\_\_ Text message: ☐ OK

Alternative Contact: \_\_\_\_\_

Relationship to Baby: \_\_\_\_\_

Home Phone: \_\_\_\_\_

Mobile Phone: \_\_\_\_\_

Discharged to Home Address: ☐ YES ☐ NO Out of DRB Area: ☐ YES ☐ NO

Language: \_\_\_\_\_ Transfer required: ☐ YES ☐ NO

**Care Providers' Contact Details**

LMC: \_\_\_\_\_ GP: \_\_\_\_\_ Well Child Provider: \_\_\_\_\_

**Screening Details**

Screening Location	Date	Time	Method	Results	Pass	Refer	Screened	Equipment	Comments
			Right	Incomplete	Pass	Refer			
			Left	Incomplete	Pass	Refer			
			Right	Incomplete	Pass	Refer			
			Left	Incomplete	Pass	Refer			
			Right	Incomplete	Pass	Refer			
			Left	Incomplete	Pass	Refer			
			Right	Incomplete	Pass	Refer			
			Left	Incomplete	Pass	Refer			

Appointment date and time: \_\_\_\_\_ Appointment date and time: \_\_\_\_\_

Appointment date and time: \_\_\_\_\_ Appointment date and time: \_\_\_\_\_

**Recommended Follow-up**

Pass	Pass	Refer Diagnostic	Refer Diagnostic	Incomplete	Refer	Lost Contact
No follow-up required	No follow-up required	Diagnostic referral	Diagnostic referral	Diagnostic	Refer	Transferred out of screening territory

Audiovisual Appointment date and time: \_\_\_\_\_ Data Input by: \_\_\_\_\_

Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Version March 2018



## How is information currently managed?



### Create Participant

NHI

Consent Given ☐ No ☒ Yes

Birth Date Time

Family Name

First Name

Second Name

Third Name

Gender ☐ Female ☐ Male ☐ Unknown

Gestational Age Weeks  Days

Well Baby ☐

HCU or SCBU ☐

Birth Location

Dnb Name

Screening Outcome

### Ethnicity

Delete	Ethnicity
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	

1 - 5

### Hearing test

Delete	DHB	Original?	Date of Test	Test Method	Right Result	Left Result	Screener initials	Comments
<input type="checkbox"/>								
<input type="checkbox"/>								
<input type="checkbox"/>								
<input type="checkbox"/>								
<input type="checkbox"/>								
<input type="checkbox"/>								
<input type="checkbox"/>								
<input type="checkbox"/>								

### Hearing Risk Factors

Delete	Risk Factor
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	
<input type="checkbox"/>	



# Universal Newborn Hearing Screening and Early Intervention Programme



## Monitoring reports

Monitoring Reports are produced by the National Screening Unit, based on screening and audiology information provided by UNHSEIP providers - the District Health Boards (DHBs). The UNHSEIP Advisory Group reviews the draft Monitoring Reports, and makes recommendations.

The draft Reports, with recommendations, are then sent to DHBs for their comment, corrections on matter of fact, and for them to respond to any specific recommendations. Responses to recommendations are published alongside the finalised Monitoring Reports.

### Monitoring Framework

Monitoring framework is a plan for the routine, systematic collection and recording of information about aspects of the programme over time. Expand this section to view the monitoring framework document

The purpose is to assess whether progress is being made on achieving the programme objectives.

The framework document covers the entire pathway from newborn screening to audiology assessment to early medical and education intervention services. The framework is centred around the UNHSEIP "1-3-6" goals.

### Downloads

- › [Universal Newborn Hearing Screening and Early Intervention Programme \(UNHSEIP\) Monitoring Framework \(pdf, 266 KB\)](#)

## Reports

### Reports into quality improvements for the UNHSEIP programme

The reports below relate to a range of improvements to the newborn hearing screening programme.

In July 2012 a screening incident was identified where some babies were not screened according to the screening protocol.

An investigation into the incident led to the quality improvement review below. That review outlined 21 recommendations to further strengthen the programme and its monitoring.

The reports below outline the progress made in implementing the review's recommendations – including an independent review into the screening test or regime.

[NSU and DHBs' progress report](#) (docx, 70.1 KB)

The document above outlines the progress made on each recommendation from the January 2013 quality improvement review of a screening event in the UNHSEIP.

[Progress on implementing the 21 recommendations](#) (xlsx, 14.3 KB)

Above is a summary of progress made on implementing the quality improvement review recommendations.

<https://www.nsu.govt.nz/health-professionals/universal-newborn-hearing-screening-programme/procedures-guidelines-and-reports>



# Universal Newborn Hearing Screening and Early Intervention Programme



## Opportunity for improvement



- Ministry of Health and District Health Boards working towards implementing a national maternity clinical information system MCIS
- Good opportunity to develop a newborn hearing screening “module” to link with MCSI
  - Baby details automatically populated for screening
  - Any relevant risk factors identified
  - Screening pathway progress management
- District Health Board Information Systems resources used to best effect



# Universal Newborn Hearing Screening and Early Intervention Programme

## Opportunity for improvement



BadgerNet

Patient Unit Reports Help

**T:1234 - BLOGGS, DI**  
DOB: 15 Jun 15 at 15:00, Ethnic Group European NFO  
Hearing Screening: Active

Search...  
**NNHSIS**  
Full notes view  
Patient reports  
Data Quality / Audit  
Administration  
Administration

### National Newborn Hearing Screening Information System

Record of baby's hearing screening

Demographic details Birth details Import screening

#### Demographics

Date of birth  
15 Jun 15 at 15:00

#### Risk Assessment

Date of last risk assessment  
16 Jun 15 at 13:15  
Syndromes  
Pendred  
Craniofacial Anomalies  
Atresia, Cleft palate  
Other Risks  
Severe neonatal jaundice at or above exchange transfusion level

#### Events

**Admission 1**  
Currently Admitted  
Admitted  
16 Jun 15 at 13:18  
Discharge this Admission

**Did Not Attend**  
Did Not Attend:  
16 Jun 15 at 13:21

#### Hearing Screening

Open:  
Active  
Current Status:  
Screening started  
Outcome:  
Refer diagnostic unilateral referral  
Update status/outcome...

**Screenings**  
16 Jun 2015  
1:28 p.m. Left Outcome  
Abort during measurement  
1:27 p.m. Right Outcome  
Not Recorded  
Record new right ear screening...  
Record new left ear screening...

#### Audiology

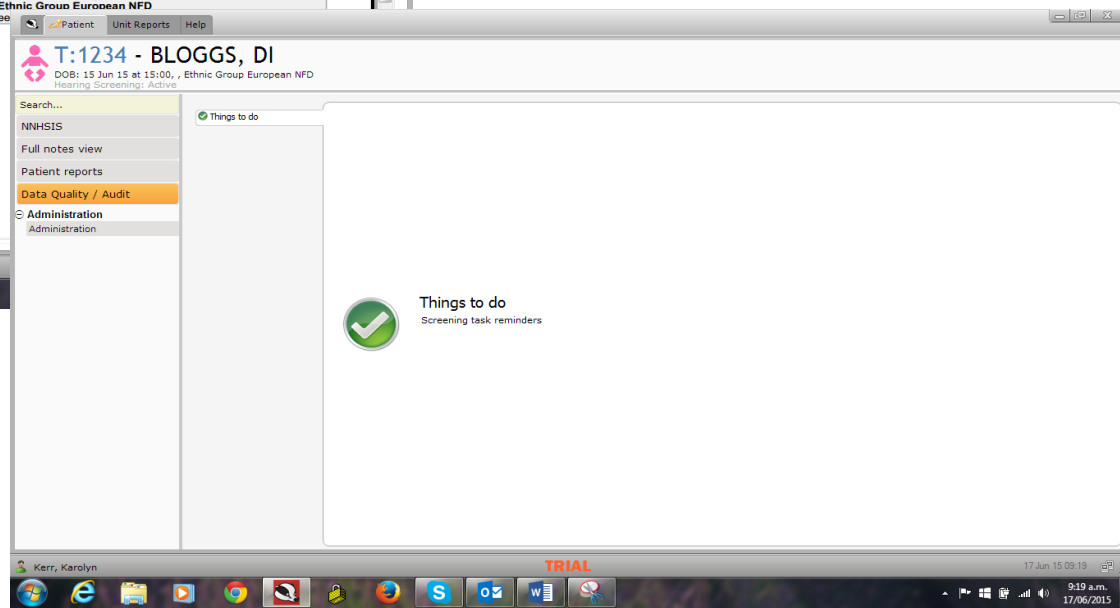
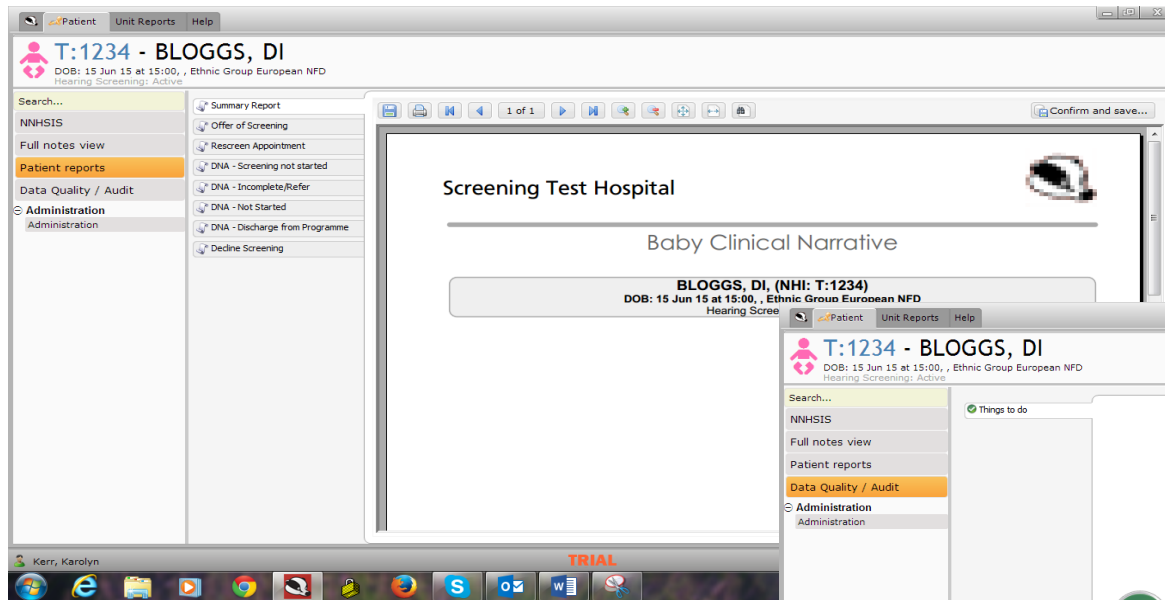
**Audiology: 16 Jun 15 at 13:30**  
Outcome  
Pass  
Audiogram  
16 Jun 15 at 13:30

Kerry, Karolyn TRIAL 17 Jun 15 09:15 9:15 a.m. 17/06/2015



# Universal Newborn Hearing Screening and Early Intervention Programme

## Managing the screening pathway





# Universal Newborn Hearing Screening and Early Intervention Programme

## Screening results and quality monitoring

The screenshot displays a software interface for hearing screening. The main window shows patient information for **T:1234 - BLOGGS, DI** (DOB: 15 Jun 15 at 15:00, Ethnic Group European NFD). The **aABR** test results are displayed, including the date tested (16 Jun 15 at 13:28), type (Inpatient), consent of caregiver (Yes), location of screening, screener name, equipment number, laptop number, ear (Left), test duration time, impedance, and quality of measuring impedance. The outcome is **Abort during measurement**, with reasons including **Abort during measurement**, **Abort before measuring**, and **Refer**. The sidebar on the left contains navigation options: **Search...**, **NNHSIS**, **Full notes view**, **Patient reports**, **Data Quality / Audit**, **Administration**, and **Administration**. The bottom of the window shows the user **Kerr, Karolyn** and the date **17 Jun 15 09:16**.

**Referral**

- Risk Assessment
- Appointment

**Risk Assessment**

- Infection: None
- Syndromes: Pendred
- Other: Severe neonatal jaundice at or above exchange transfusion level

**Upcoming Appointments**

- No upcoming appointments

**Hearing Screening**

- Screening 16 Jun 2015
- 1:28 p.m. Left ear
- Outcome: Abort during measurement
- 1:27 p.m. Right ear
- Outcome: not recorded

**Screening Status**

- 16 Jun 15 at 13:30 Screening started
- Outcome: Refer diagnostic unilateral referral

**Update status/change outcome**



# Universal Newborn Hearing Screening and Early Intervention Programme



```
"" "" "" "" "3.50,4.31", "" "" "2015-06-09 14:27:56" "" ""  
" " "13.72,6.34" "" "" "2015-06-09 14:04:52" "" "" "81" "" ""  
"13.24,6.97" "" "" "2015-06-09 13:54:04" "" "" "69" "" "" "0"  
"" "" "" "" "10.24,5.58" "" "" "2015-06-09 13:22:33" "" ""  
"" "" "" "" "5.96,6.01" "" "" "2015-06-09 13:19:41" "" "" "81"  
"" "" "" "" "8.83,4.46" "" "" "2015-06-09 13:12:19" "" "" "29"  
"" "" "" "" "6.81,6.85" "" "" "2015-06-09 13:09:57" "" "" "35"  
"" "" "" "" "11.77,5.74" "" "" "2015-06-09 12:02:38" "" "" "2"  
" " "" "" "" "12.71,7.91" "" "" "2015-06-09 12:00:04" "" "" "17"  
" " "" "" "" "14.92,6.78" "" "" "2015-06-09 11:58:38" "" "" "17"  
"" "" "" "" "9.68,6.10" "" "" "2015-06-09 11:55:27" "" "" "17"  
"" "" "" "" "88.26,95.18" "" "" "2015-06-09 11:53:28" "" "" ""  
" " "" "" "" "9.77,6.46" "" "" "2015-06-09 11:48:59" "" "" ""
```



SGMASTER BERAphone monitoring data template 2015  
Desktop



# Universal Newborn Hearing Screening and Early Intervention Programme

## Audiology management and results

The screenshot displays a software interface for managing newborn hearing screening. The main window is titled 'Audiology' and shows patient information for 'BLOGGS, DI, (NHI: T:1234)' with a date of birth of '15 Jun 15 at 15:00' and 'Ethnic Group European NFD'. The hearing screening status is 'Active'.

The interface is divided into several sections:

- Administration:** Includes fields for 'Test Date/Time' (16 Jun 15 at 13:30), 'Inpatient' (checked) and 'Outpatient' (unchecked) status, 'DHB name', 'Clinic name', 'Testing technique' (ABR, Behavioral audiometry, DP OAE, and Immittance testing are all checked), and 'Audiologist'.
- ABR:** Includes 'Test type' and 'Outcome' dropdowns, and a 'View/Enter Audiogram' button.
- Behavioural Audiometry:** Includes 'Test type', 'Equipment', 'Stimulus', 'Stimulus presentation', and 'Frequency' dropdowns, and radio buttons for 'Completed', 'Not Completed', and 'Inconclusive'.
- Audiogram:** A summary of the test results, including 'Screening 16 Jun 2015' with outcomes for 'Left ear' (1:28 p.m. Left ear) and 'Right ear' (1:27 p.m. Right ear), and 'Screening Status' (16 Jun 15 at 13:30 Screening started, Outcome: Refer diagnostic unilateral referral).
- Risk Assessment:** Includes 'Infection: None', 'Syndromes: Pendred', and 'Other: Severe neonatal jaundice at or above exchange transfusion level'.
- Audiology: 16 Jun 15 at 13:30:** Includes 'Testing Technique: ABR, Behavioral audiometry, DP OAE, Immittance testing' and 'Outcome: Pass'.

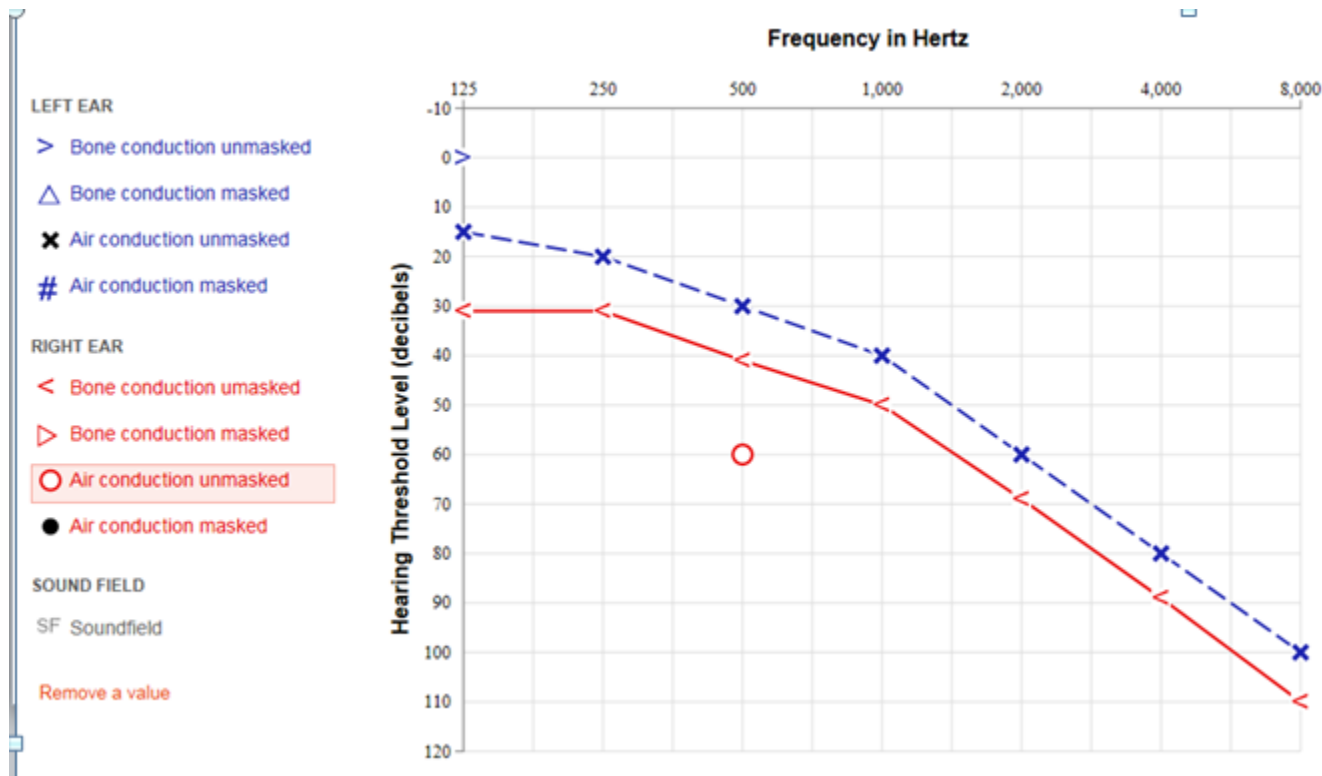
The interface also features a sidebar with navigation options like 'Patient', 'Unit Reports', 'Help', 'Search...', 'NNHSIS', 'Full notes view', 'Patient reports', 'Data Quality / Audit', and 'Administration'. The bottom of the screen shows a Windows taskbar with various application icons and a system clock indicating '17 Jun 15 09:18'.



# Universal Newborn Hearing Screening and Early Intervention Programme



## Audiogram from ABR testing





# Universal Newborn Hearing Screening and Early Intervention Programme



## Other key features of NHIMS

- Automatic reporting at the local level – regular reports generated, and ability for bespoke reporting
- Automatic reporting at the national level – regular reports generated, and ability for bespoke reporting
- Electronic repository for ABR traces to facilitate clinical review and support processes
- Secure information storage with fail-safes
- “break-glass” function to enable records to be viewed by another location, with appropriate permissions



"THE SECRET OF  
CHANGE IS TO FOCUS  
ALL OF YOUR ENERGY,  
NOT ON FIGHTING THE  
OLD, BUT ON BUILDING  
THE NEW."

— *SOCRATES*



# Universal Newborn Hearing Screening and Early Intervention Programme



## What doesn't change?

- The '1, 3, 6' goals
- A focus on equitable screening, informed consent and continuous quality improvement
- Why we're screening...

