

## **Enhancing Laboratory Efficiency: Implementation of Revvity Transcribe Al for Automated Data Entry in Newborn Screening**

Ephrem Chin, Andrew Millerschoen, Antti Mikkonen, Chris Murphy, Jacob Decker, Ken Sredzienski, Justin Anderle, Maria Ralph, Madhuri Hegde

**Revvity OMICS Pittsburgh** processes >500,000 tests per annum on a wide variety of multi-OMICS test platforms. Services such as biochemical testing in support of Newborn Screening (NBS) to high complexity genomic sequencing, our laboratory often receives handwritten dried blood spot (DBS) cards or paper test requisition forms (TRF).

Two key metrics were evaluated: accuracy and processing speed improvement.

Accuracy was determined by comparing Transcribe Al output with human-validated data. For each card, a total of ten fields containing demographic information were processed. The fields included input types such as handwritten names, birthdates, and checkboxes.

## Performance

Over the initial three-week implementation period, Transcribe AI demonstrated a total field accuracy score of 73.3% over 1,913 cards processed. Accuracy of the reading depended on the field type and card layout. Fields such as names and medical record numbers were read at over 86% accuracy, while fields with tight layout had poorer accuracy. During the initial development phase, Transcribe AI caught transcription errors that were made during the manual data entry process.

In terms of processing speed, the system showed significant improvements. During the first week of implementation, processing speed increased by 36%, from 36 cards per hour per person to 50 cards per hour. After two weeks of use, the processing speed further improved to 57 cards per hour per person, representing a 58% overall improvement in processing speed.

Manual data entry from such handwritten documents into the laboratory informatics systems is a time-consuming process and prone to transcription errors. To address this challenge, we developed "Revvity Transcribe AI," an innovative solution leveraging **Optical Character Recognition** (OCR) and Machine Learning (ML) to convert handwritten text into a digital format. Starting with our NBS program, our objective was to increase the processing speed of data entry from DBS cards with as good as or better transcription accuracy compared to our established manual input process.

Processing speed improvement was assessed by measuring the time taken to pre-populate data entry fields using Transcribe AI and subsequent human validation of the text. First measurement was done right after implementation of the solution, second one three weeks after daily use.

Before implementation, Transcribe Al was run in parallel to the existing manual data input process, where handwritten data was digitized by Transcribe AI and compared to the data that was manually entered into the LIMS by laboratory personnel.



With an increase in processing speed, we estimate that our laboratory will realize

> >\$150K++ Automation savings vs manual data entry for NBS service alone

How Revvity Transcribe Al works Ro  $\bowtie$ Prepare cards Data transfer Validate results Dry blood spot A quick human (DBS) cards arrive review ensures accuracy befor and are checked organized fo for completeness. processing and transfers data tigital format via between Revvity scanned. ranscribe Al. Transcribe Al and your lab system.

Figure 1: Transcribe AI workflow

## Methods

Revvity Transcribe AI was

Specimen DBirth	] Repeat Specimen → Initial FP#:	Rea	ason: C<24 hr. Unsatisfactory Abnormal C Transfused I teconolusive		
University Example		Code H7a	BABY'S Name (Last) BABY'S Name (First)		
		Code	Smith Baby's Last Name at Discharge Baby's First Name at Discharge		
Address if no CODE given		-			
MOTHER'S Name (Last) MOTHER'S Name June			02 1/0 125 01:00 Bit Wi 2220 grs. DR		
Bleent (PO Box) 123 Main ST City	State Z	ip (	Collection Date: Time (Military) Current WL 2245 gms Dib 02/1/125 03:30 Drawn By: PM Waeks Gestation: Medical Record # 38 M 12534		
Forest MS 3 Mother's E-mail Nother's Phone (123)43		39624 136 - 78	Transfused Date: / / Time (Military) Gest. Age		
BELKY JONES	Emergency	Contact # 765 = 43	Race (check all that apply): Hispanic: Yes X No		
Mother's Date of Birth OI 10/ 185 * Mother's Medical History:	Footing: Broast Soy		Newton: PCP / Practice Name Dr. Jones (535)475=128 Street (PO Box)		
Hypertension Opiold Use Maternal PKU Diabetes	Hearing Screening completed:		789 Main ST City State Zp		
Thyroid Disease Other: HBsAg: Pos. XNeg. Unknown			Juckson     MS     39216       Final O2 Result     Presed     WBN       Failed     INICU     Date:     0211125       If not performed,     Presedel listal echocardiogram     On 02     Expired		

Figure 3: Speed improvements during the initial three weeks of deployment

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Email:			Mother's Ph: (12	3) 456-7890
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## Conclusion

**Revvity Transcribe AI is** a valuable tool in a high throughput testing laboratory that receives handwritten test information

By automating data entry, the system allows for more effective utilization of human resources, enabling staff to focus on other critical tasks The implementation of Transcribe Al presents

opportunities for laboratories to substantially increase their productivity.

implemented at the Pittsburgh **Revvity Omics laboratory** in conjunction with Revvity Instrument Hub to process images

of DBS cards to reduce manual

input work.

Figure 2: Exemplar handwritten NBS DBS card received from a collection site and the data in LIMS after digitization by Transcribe AI



Testing/Deployment taking place for non-NBS handwritten TRF

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