The Global Language of Business

Utilising GS1 barcodes for improved patient safety with reference to retail POS systems

GS1 Healthcare Webinar

Dr. Makoto Sawada, Research Associate in the Department of Anesthesiology
Tokai University Hospital in Japan

January 16, 2020

Welcome and thank you for attending!

- Welcome to our January 2020 webinar.

  Thank you to our guest speaker Dr. Makoto Sawada, Research Associate in the Department of Anaesthesiology, Tokai University Hospital in Japan
- Some housekeeping for today:
  - All attendees will be in listening-only mode
  - If you have questions during the presentation, please type them into the questions area and these will be monitored then answered at the end of the call
- After the webinar:
  - Within a week, the recording will be posted to: http://www.gs1.org/healthcare/hpac_webinars
  - All previous webinars are also posted to this location, so please feel free to use this resource and share the link

GS1 Healthcare Webinars

Create a forum for the global clinical provider environment for thought leaders and adopters of GS1 Standards in healthcare. The final goal: improve patient safety, cost efficiency and staff productivity through the implementation of GS1 standards.

A forum for sharing and discussion

- The practical realities of implementation of GS1 Standards in the care giving environment in regard to the impact on clinical care and patient interaction

Identification of projects and case studies

- Supporting the adoption of GS1 Standards in healthcare providers and retail pharmacies
- For publication, presentation and sharing

A source of expertise and advice

- To those involved in GS1 standards development, the wider Healthcare stakeholder community and senior executives/decision-makers to gain their buy-in and support for implementation of GS1 Standards

Specific GS1 Healthcare Activities

Webinars

- Bimonthly webinars open to all stakeholders interested in learning about GS1 standards implementation in the care giving environment.
- http://www.gs1.org/healthcare/hpac_webinars

Awards

- At each global GS1 Healthcare Conference
- Provider Implementation Best Case Study Award
- Provider Recognition Award
- The prize: travel & accommodation to attend the next GS1 Healthcare conference
- http://www.gs1.org/healthcare/hpac

GS1 Healthcare holds two global conferences per year.
The next conference will be in Paris, France from March 24–26, 2020.
We will have significant Healthcare Provider participation on the agenda.

Utilising GS1 barcodes for improved patient safety with reference to retail POS systems

Dr. Makoto Sawada
Research Associate in the Department of Anaesthesiology
Tokai University Hospital

Self-introduction

Who am I

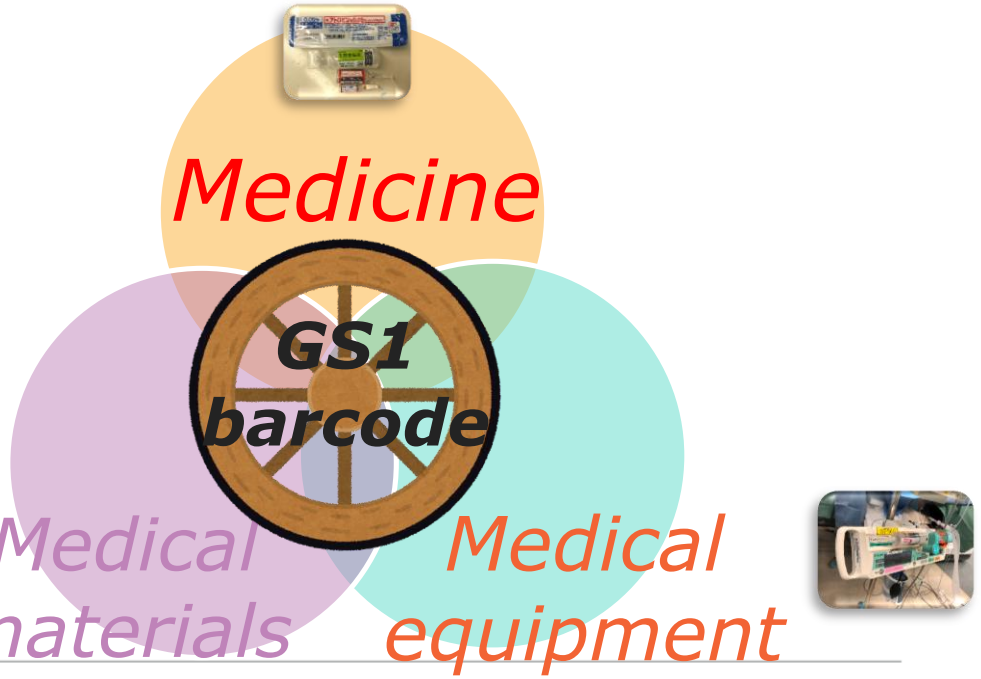
Dr. Makoto Sawada

- 14 years as an anaesthesiologist at Tokai University Hospital, Japan
- 30+ years experience with IT systems
- Responsible for surgical information systems
- Leads GS1 standard/barcode implementation at Tokai University Hospital

Background

The GS1 barcode is a **medical information system hub** for handling medical products.

- **Bring multiple uses**
- **Improve safety and efficiency**
- **System construction is inexpensive**



Agenda

1. **GS1 barcode usage in the retail sector in Japan**
2. **Introduction of Tokai University Hospital**
3. **Study on effectiveness of GS1 barcodes in hospitals**
   - Safety
   - Efficiency
   - Information utilization
4. **Summary**

1. GS1 barcode usage in the retail sector in Japan

GS1 barcode in the retail sector

Recall support
Expiration date confirmation
safety

Efficiency
Labour saving
Data linkage

Information utilisation
Sales management
Inventory control

Recall cases

Battery Performance Alert and Cybersecurity Firmware Updates for Certain Abbott (formerly St. Jude Medical) Implantable Cardiac Devices: FDA Safety Communication

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Date Issued:

April 17, 2018

FDA U.S. FOOD & DRUG ADMINISTRATION

Healthcare crisis

- Deterioration of hospital management is a social problem in Japan.
- It can lead to inadequate operations and suspension of medical service provision.

日本経済新聞

424病院は「再編検討を」　厚労省、全国のリスト公表

2019/9/26 15:10｜日本経済新聞　電子版

厚生労働省は26日、市町村などが運営する公立病院と日本赤十字社などが運営する公的病院の25%超にあたる全国424の病院について「再編統合について特に議論が必要」とする分析をまとめ、病院名を公表した。診療実績が少なく、非効率な医療を招いているためだ。ベッド数や診療機能の縮小なども含む再編を地域で検討し、2020年9月までに対応策を決めるよう求めた。

一般病院赤字、利益率マイナス２．７％　診療所、薬局は黒字維持　１８年度厚労省調査


会員限定有料記事　毎日新聞 2019年11月14日　東京朝刊

経済一般 > 朝刊・総合面 > 紙面掲載記事 > 社会 > 医療 > サイエンス >

医療機関ごとの利益率

	2017年度	18年度
病　院	▼3.0	▼2.7
一般診療所	13.0	12.9
歯科診療所	20.2	20.5
薬　局	6.9	5.5

※▼はマイナス、単位は%

医療機関ごとの利益率

厚生労働省は１３日、医療機関の経営状況を調べた２０１８年度の医療経済実態調査結果を公表した。一般病院１施設当たりの利益率はマイナス２・７％で、１７年度に比べ０・３ポイント改善したものの赤字が続いた。厚労省は人件費の増加が一因と分析する。病院以外の利益率は、一般診療所が１２・９％、歯科診療所２０・５％、薬局５・５％と黒字を維持した。

Improved hospital management is important for patients

GS1 barcode display rate for medical products in Japan

Medicine
100%

Medical materials
84.1%
(※97.7%)

Medical equipment
84.1%

(Source) Information progress survey, the Japanese Ministry of Health, Labour and Welfare

Why can’t hospitals use GS1 barcodes?

- **We should learn from other industries** in this regard for the following reasons:
  - Effectiveness is clear
  - Low cost
  - Easy system construction
  - Operation problems are easy to solve

Bringing the results in the retail sector to healthcare!

What we do now

https://www.dsri.jp/gshealth/disclosure/movie.html

Why not spread the use of GS1 barcodes?

- In 2018, the Ministry of Health, Labour and Welfare conducted a questionnaire survey about the use of GS1 barcodes in 1227 hospitals.

According to the survey, the **implementation costs** and **low awareness** on GS1 standards are the main obstacles faced by hospitals.

Tokai University Hospital conducted four studies to demonstrate the benefits of GS1 barcodes

2. Introduction of Tokai University Hospital

Tokai University Hospital

- Acute care hospital near Tokyo

Diagnosis and treatment departments	35
Hospital beds	804
Operations	12,522 (2018)
Medical materials registered in master data	54,282

- **Utilise GS1 barcodes for medical materials management in the operation theatres.**

- Record product names, lot numbers and expiry dates with GS1 barcodes.

How the GS1 barcode was introduced

Listen to the need from each department.

Organizing the requests. Selecting GS1 barcode as the best technology.

Providing the required technology is the key to success.

Head nurse

Is there a simple medical material accounting method?

Surgeons

Want to manage lot/batch and serial numbers easily

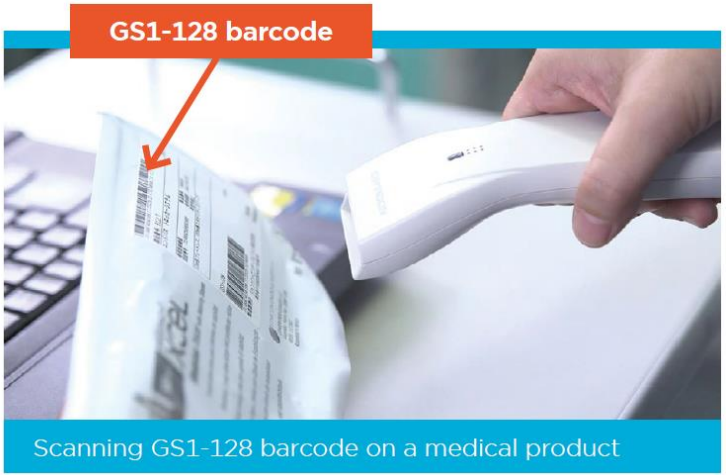
System department

Eliminate paper, and digitise

Collect the empty packages of medical products

To record medical product use history

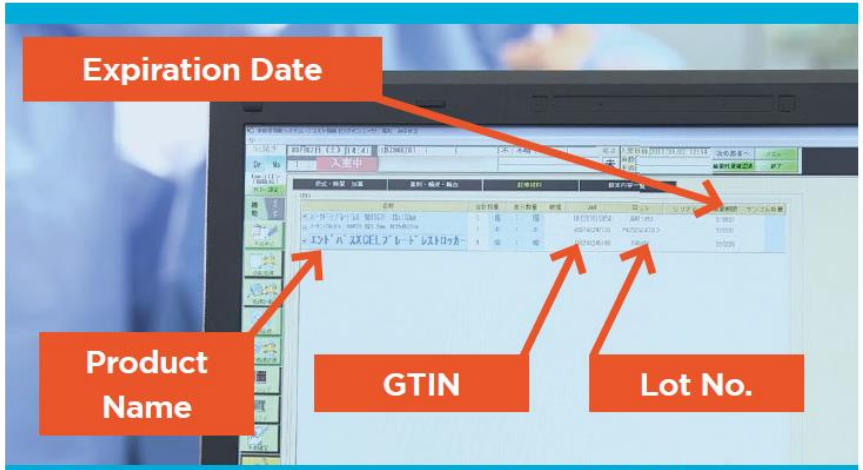
- During a surgical operation, nurses store the empty packages of medical products that are used for an operation in a plastic bag.
- Then, nurses scan the GS1-128 barcodes on those packages when they are not busy during the operation.



Scanning GS1-128 barcode on a medical product

Scan the barcodes

- By scanning barcodes, the management system imports data from the GS1-128 barcode and automatically saves the GTIN, the lot or serial number and the expiration date.
- The management system automatically sends the data to the EMR system.



Data is captured from scanning the GS1-128 barcode and recorded in the operating theatre management system.

How to handle materials without a barcode

- For medical products without a barcode on their primary packages or for extremely small products such as brain surgery clips, we created a barcode sheet by copying the barcodes on their secondary packages.

Barcode sheet

Before and after the implementation of GS1 barcodes

Before the implementation of the system

During or after an operation, nurses count the number of medical products used for the operation and fill out a cost bill form.
In addition, they peel off product labels, which include information such as product name, lot number, and expiration date, from their packages, and put them onto a recording form.

Paperwork

Workers of operation ...tre scan the two forms using a image s... to record into EMR system as medical hist...

The cost bill form is sent to the division which is in charge of reimbursment claims. Workers there enter the information on the form into the reimbursement system manually to calculate the cost of the operation.

After the implementation of the system

During an operation, nurses scan GS1-128 barcodes of medical products. The product name, GTIN and lot numb... are automatically recorded into th... ...m.

A scan

Data is automati... ...warded to the EMR system

Data is automatically forwarded to the reimbursement claim system

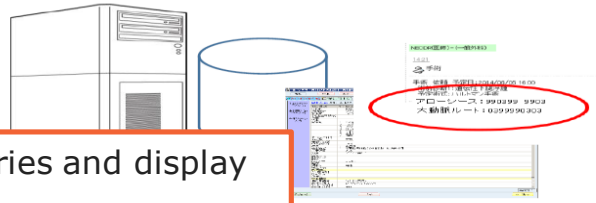
Overview of medical information systems

Data flow of medical materials

Surgical information system

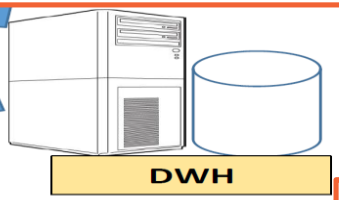
Register product information with GS1 barcodes

Electronic medical record



Receive use histories and display the information

Collect medical material information into data warehouse



Accounting system

Receive the information for reimbursement

Reference system

Analyse usage data of medical materials

System modification costs for GS1 Barcodes

- System development（Initial）
  - Modification of electronic medical record systems $55,000
  - Development cost of medical materials master data (incl. GTINs) $33,000
- System maintenance
  - Management of master data $1,100/m

＜Total amount＞

Initial cost	$88,000	Maintenance costs	$1,100/m

Using established standard technology

No need for in-hospital barcode issuing system

No need for label printing and printer

Reduction of labour costs attaching barcode labels in hospital

Realised the inexpensive implementation of GS1 barcodes

3. Study on effectiveness of GS1 barcode in hospitals

The national project for traceability utilising GS1 barcodes

- Tokai University Hospital joined the national project for traceability of medical products.

- The outcomes of four studies in the hospital clearly showed the benefits of GS1 barcodes.

<What we want>

Safety improvement	: Check recall information and expiration dates
Efficiency	: Reduce data entry burden
Data utilization	: Confirm GS1 barcode display rate is high enough to record medical materials

Study 1 Safety improvement: Recall cases

- Purpose : Ensure traceability when recall occurs
- Method : Randomly assign four products as being recalled and find the target products.
- Compare detection time in the following two groups
  - ✓ **Manual check group** : Visually check the lot numbers stored in the electronic medical record in PDF format
  - ✓ **System check group** : Search by the lot numbers recorded in DWH

- Material type and patient numbers

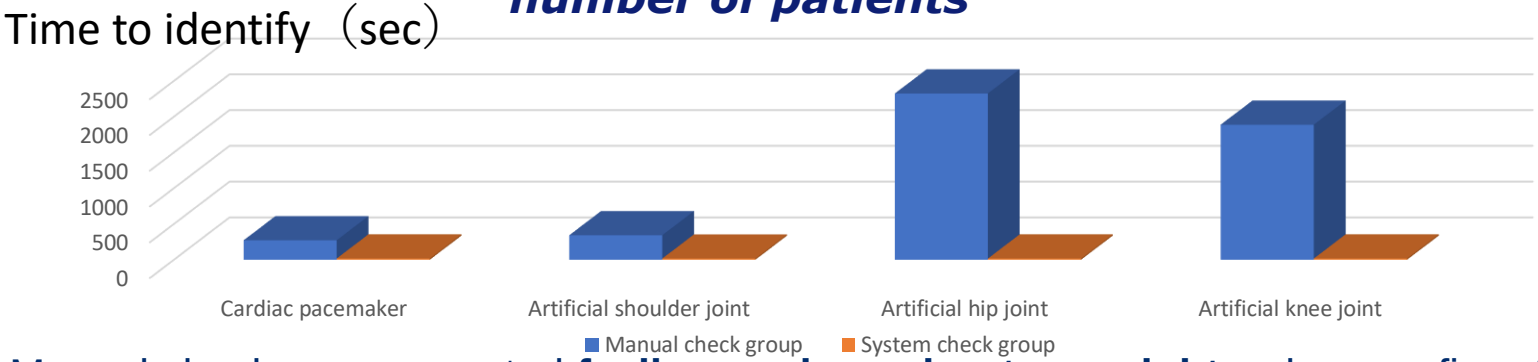
  (Cardiac pacemaker, artificial knee joint, artificial hip joint, artificial shoulder joint)

Number of patients who may have used the product	10-50 /item
Actually used	1 or 2 / item

Study 1 Result

Manual check group *:Time was required in proportion to the number of patients (Approx. 1 minute / person)*

System check group *:Identified in about 18 seconds* ***regardless of the number of patients***



Manual check group reported **feeling anxious about oversights** when confirmation exceeded 30 patients.

For managing recalls, it is necessary to build a database that can record lot numbers

Study 2 Improved patient safety : Expiry date confirmation

- Method:
  - ✓Create expired dummy product labels, and attach them to products.
  - ✓Inform staff of expired products, and encourage them to check visually.
  - ✓After the visual check, staff scan the barcode on the label.
- This trial took place three times over several days.

Normal label

Modified label

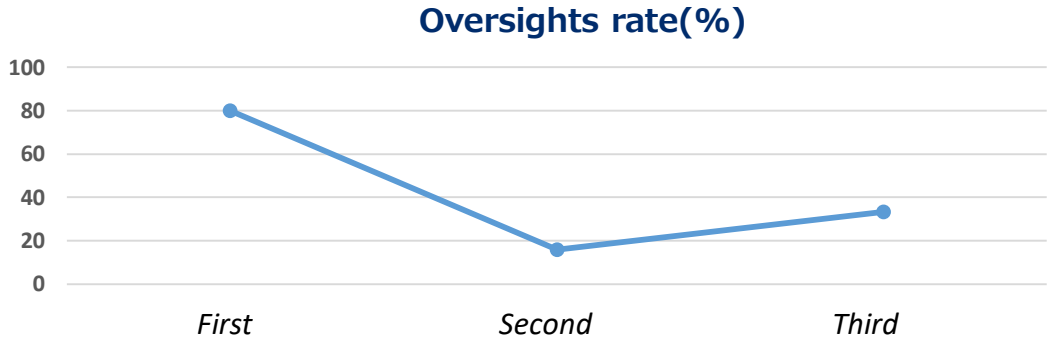
Product with a modified label

Alert function

When a dummy barcodes was scanned, meaning that the staff overlooked an expired product, a warning is displayed as shown in the figure.

Study 2 Result

This figure shows the oversights rate by visual checks.



- The decrease in the second and third oversights rate may be due to the fact that the first was a training for the second and third.
- However, we **could not completely eliminate errors**.
- In operation theatres, staff handle many materials, so it is **almost impossible to prevent oversights completely** even after training.

The alert function was very effective because it found all the oversights.

Study 3 Efficiency : Reduce work time

- Purpose: Examine the effect of shortening the time for accounting process
- Method:

  Collect the medical materials' information used for surgeries

  Compare the time for accounting process in the following two groups

  - ✓ **Paper form group** : Fill in accounting forms
  - ✓ **Barcode group** : Scan GS1 barcodes on the materials

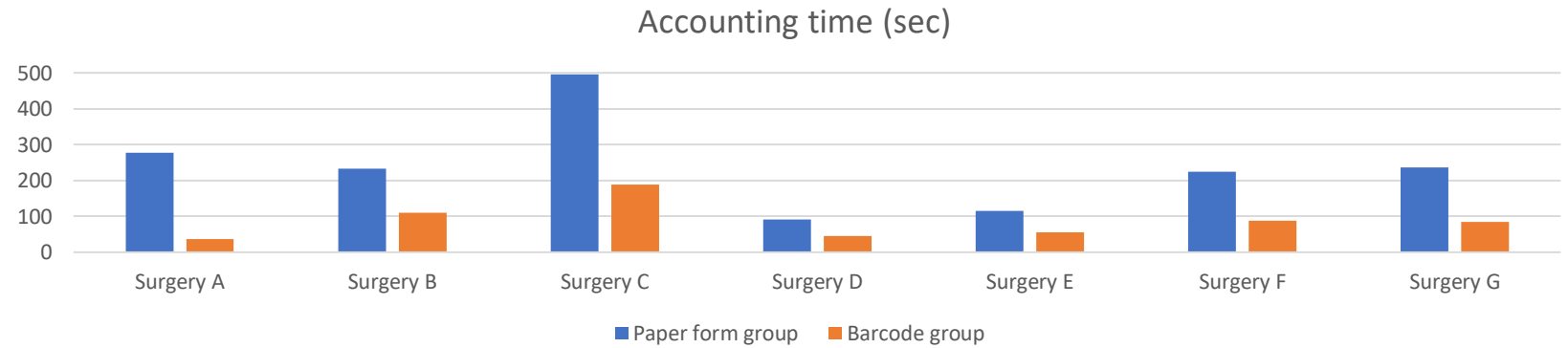
- Target:

  Seven types of surgery consisting of digestive surgery, gynecological surgery, and cardiovascular surgery

  ※ Includes laparotomy and laparoscopic surgery

Study 3 Result

- Accounting time of each surgery



- Comparing with the paper form group, the barcode group **saved more than 50% of the accounting time**.
- Time savings tended to **increase as the number of materials increased**.

Savings in accounting time allow our staff to focus on patient care.

Study 4 Data utilisation

- GS1 barcoding rate is not 100% in Japan, which is taken as the obstacle to use GS1 barcodes in hospitals
- Prevalent views on GS1 barcodes among healthcare staff
  - ✓ If it is not 100%, medical billing cannot be done.
  - ✓ If it is not 100%, medical records cannot be made.
  - ✓ Materials without barcodes may be crucial to the human body.
  - ✓ If it is not 100%, it can not be used for surgery cost analysis.

- We manually calculated the number and costs of all medical materials used for two type surgical operations (digestive surgery & cardiovascular surgery) to confirm if those view were true.

Study 4 Result

- The characteristics of the products without GS1 barcode were as follows:

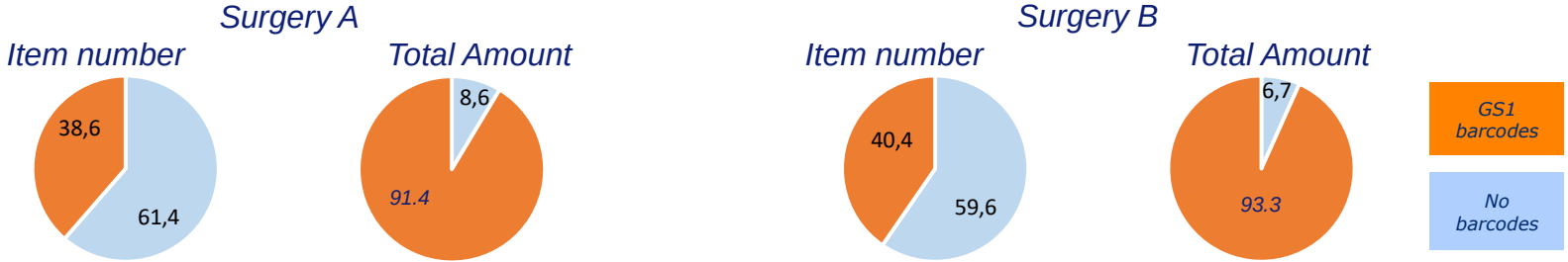
✓ Most of the materials were **consumables** and not required for accounting or medical records.

Injection needle, gloves, cotton for disinfection, etc.

✓ Most of the products were **low risk products** for temporary use on the body surface.

Scalpel blade, Tympanic thermometer, electric scalpel discharge plate, etc.

✓ The percentage of medical material without GS1 barcodes is about 60% in number, but **less than 10% of the total material price**.



The GS1 barcode is **sufficiently useful** for **hospital management** as well as **patient safety**.

Summary

GS1 barcodes have the function as an **information hub**

Recall support
Expiration date confirmation
safety

Efficiency
Labour saving
Data linkage

Information utilisation
Sales management
Inventory control

Let’s start with a **Simple Scan**

GS1 barcode can be a medical product information hub

GS1 Healthcare webinar:
Questions and contact details

Makoto Sawada
Anaesthesiologist at Tokai University Hospital, Japan
E-mail : sawada_m@is.icc.u-tokai.ac.jp

Fumi Maekawa
Researcher, GS1 Japan
E-mail : f-maekawa@gs1jp.org

Els van der Wilden
Director Healthcare Providers GS1
Tel +31615545868
E-mail: els.vanderwilden@gs1.org

www.gs1.org

Questions