



IDENTIFICATION  
SOLUTIONS

# Surgery and the 3r's: Reduction, Refinement, and RFID? How RFID can increase the 3R's while Providing Essential Data to the Researcher

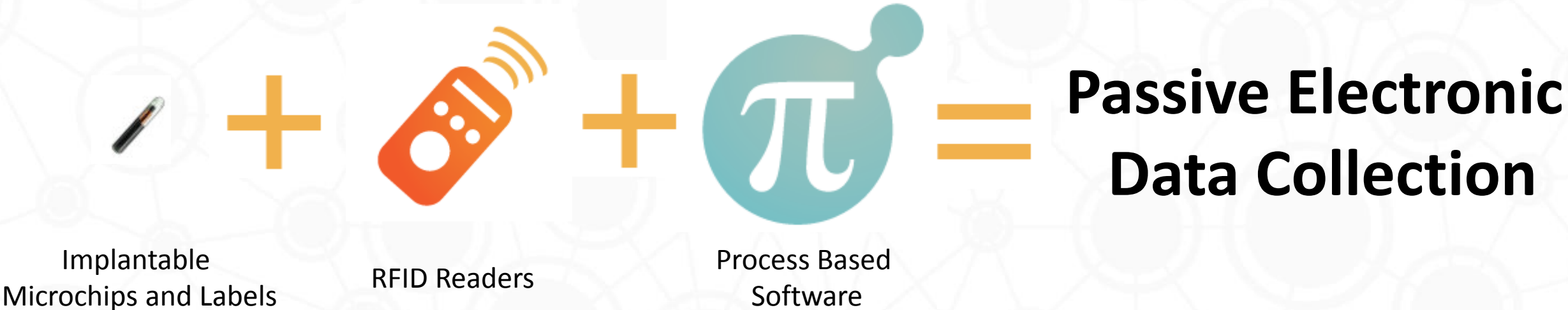
Matthew Ruiter UID Identification Solutions  
10/15/2017  
AALAS Technical Presentation



# Making the Process of Data Collection More Efficient

- π Using RFID Technology and Software to Provide Passive Data Collection in Order to Reduce or Eliminate Pen and Paper
- π Record Surgical Data Using RFID and Software to Streamline The Surgical Processes
- π Provide Data from a Animal Surgical Provider to You the Researcher
- π Other Areas where Passive Data Collection is Useful

# RFID Technology and Software can Provide Passive Data Collection



# Benefits of RFID Technology and Software in the Surgical Suite

- π Reduction of Animals Used
- π Refinement of the Surgical Process
  - ∞ 100% Data capture
  - ∞ Streamlining of the surgical process
- π Replacement of Pen and Paper to Automatically Recorded Data
- π Data Analytics for Process Optimization

# UID Partnered with Envigo Research Models & Services

## Requirements

- π Utilize a Passive Data Collection System
- π Record All the Data Generated by Each Surgery
- π Eliminate Paper in the Surgical Suite
- π Track Surgeon Times, Success and Training
- π Improve Overall Efficiencies and Outcomes – Three R's
- π Provide Recorded Data to you the Researcher

# Surgical Data Recording Surgical Worksheet

## Surgical Operations Worksheet

Site 237

Procedure Date: 7/27/17

Surgical Procedure: JVC/PVC

Surgical Code, if applicable: STDCATH

Strain: SD Sex: MALE

DOB: 6/9/17

Requested Age/Weight: 220-250G

Isoflurane

Ketamine + Xylazine dose (mL) N/A

Ketoprofen or Buprenorphine dose (mg) 0.24

Catheter Implantation Depth (mm)

Catheter type/gauge: SAI-RJVC2 2-EV-10/SAI-PVC-EV-10

Lack Solution: JVC-50/50/PVC-50/50

Post Op Fluid(s) type(s)

Quantity for order: 15 Extras 64

Customer: XXXXXXXXXXXXXXXX

Envido #: 282006-2826526

Ship date: 7/31/17

Catheter Lot #: RJVC22060117/PVC020317

Closing Method: STANDARD

Start time: 7:11 End time: 7:36  
 Start time: 8:14 End time: 9:51  
1049 1307 1307

Crutches only: NP

### Post-surgical Information

DATE: 7/27/17 DATE: DATE: DATE: 7/31/17

Tech: KC Tech: Tech: Tech: LLJSC

| Animal # | Weight (g) | Anesthetic Given | Eye Ointment Applied | Blood volume (ml) | PVC Strain | JVC Strain | Close | Prep | Surgery Results | Clinical Score | Weight (g) | Feewy (per cat) | Clinical Score | Weight (g) | Feewy (per cat) | Clinical Score | Weight (g) | Feewy (per cat) | Actual Shipped | Animal # |     |   |    |
|----------|------------|------------------|----------------------|-------------------|------------|------------|-------|------|-----------------|----------------|------------|-----------------|----------------|------------|-----------------|----------------|------------|-----------------|----------------|----------|-----|---|----|
| 1        | 228        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | JC   | 1               | 01             | 215        |                 |                |            |                 |                |            |                 | 27             | 232      | CP1 | ✓ | 1  |
| 2        | 229        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | JC   | 1               | 01             | 211        |                 |                |            |                 |                |            |                 | 27             | 224      | CP1 | ✓ | 2  |
| 3        | 228        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 215        |                 |                |            |                 |                |            |                 | 27             | 232      | CP1 | ✓ | 3  |
| 4        | 223        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 217        |                 |                |            |                 |                |            |                 | 27             | 232      | CP1 | ✓ | 4  |
| 5        | 229        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 217        |                 |                |            |                 |                |            |                 | 27             | 232      | CP1 | ✓ | 5  |
| 6        | 235        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 220        |                 |                |            |                 |                |            |                 | 27             | 236      | CP1 | ✓ | 6  |
| 7        | 232        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 222        |                 |                |            |                 |                |            |                 | 27             | 232      | CP1 | ✓ | 7  |
| 8        | 234        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 224        |                 |                |            |                 |                |            |                 | 27             | 244      | CA  | ✓ | 8  |
| 9        | 226        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 27             | 220        |                 |                |            |                 |                |            |                 | 27             | 239      | CP1 | ✓ | 9  |
| 10       | 227        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 216        |                 |                |            |                 |                |            |                 | 1              | 235      | CP1 | ✓ | 10 |
| 11       | 245        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 241        |                 |                |            |                 |                |            |                 | 27             | 260      | CA  | ✓ | 11 |
| 12       | 239        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 225        |                 |                |            |                 |                |            |                 | 27             | 241      | CP1 | ✓ | 12 |
| 13       | 230        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 232        |                 |                |            |                 |                |            |                 | 1              | 238      | CP1 | ✓ | 13 |
| 14       | 225        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 216        |                 |                |            |                 |                |            |                 | 1              | 231      | CP1 | ✓ | 14 |
| 15       | 227        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 218        |                 |                |            |                 |                |            |                 | 24             | 226      | CA  | ✓ | 15 |
| 16       | 244        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 229        |                 |                |            |                 |                |            |                 | 27             | 252      | CA  | ✓ | 16 |
| 17       | 223        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 214        |                 |                |            |                 |                |            |                 | 27             | 228      | CP1 | ✓ | 17 |
| 18       | 238        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 239        |                 |                |            |                 |                |            |                 | X              | X        | X   | X | 18 |
| 19       | 227        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 224        |                 |                |            |                 |                |            |                 | 27             | 240      | CP1 | ✓ | 19 |
| 20       |            | ✓                | 0-0-0                |                   |            |            |       |      |                 |                |            |                 |                |            |                 |                |            |                 |                |          |     | ✓ | 20 |

stop

stop

stop

1  
2  
3  
4

OREC reviewed prior to use (initials) JC

all animals given ketoprofen #s 1-17,19  
KC/JC

- π Not Everyone has Perfect handwriting
- π Notes can be placed everywhere
- π Access to the data is difficult



# Solution

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- π Surgical Data Recording Platform that utilizes RFID as the Data Collection System
- π Provided RFID Components that Fit the Process and is Passive
- π Used existing Database Engine and Modified the User Interface to Recorded the Data Needed.



# Pi Surgical Suite

pi Suite

APPS INVENTORIES TOOLS

READER DISCONNECTED

- CHIP PROVISIONING
- WEIGHING
- SURGERY
- TK / PK
- CAGE TRACK
- ANIMAL RECEIVER
- GENERAL SCAN

+


+

$\pi$

=

**100% VERIFICATION**

Local Time: Wednesday, October 11, 2017 10:36 AM



uid IDENTIFICATION SOLUTIONS

# Pi Surgical Suite – Order Entry

APPS INVENTORIES TOOLS READER DISCONNECTED

**SURGERY**

Surgery - New

\* Personnel RFID

\* Customer Name  \*\* Order Number

Shipping Address  \*\* Envigo Number

\* Date Required  Surgery Date

\* Species

Model / Strain

| Qty. Animals | Qty. Required | Qty. Extra | Total |
|--------------|---------------|------------|-------|
| Males        | 0             | 0          | 0     |
| Females      | 0             | 0          | 0     |
| Total        | 0             | 0          | 0     |

Food Type   
 Is DOB the same for all animals

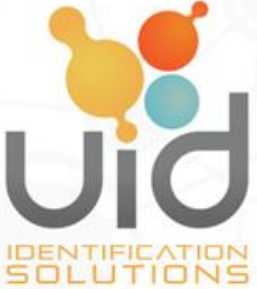
| Animal Ranges | Measure Unit | Surgery Range            | Surgery Min | Surgery Max |
|---------------|--------------|--------------------------|-------------|-------------|
| Age           | d - Days     | <input type="checkbox"/> | 0           | 0           |
| Weight        | g - Grams    | <input type="checkbox"/> | 0           | 0           |

**Surgeries**  **Soft Tissues**

Additional Details

\* = Mandatory field (Cannot be empty)  
 \* = Unique field

- π Order Entry
- π Animals, Drugs, Bodyweights
- π Surgeries
- π Ship date



# Pi Surgical Suite - In Surgery



| Surgeon                                     | Closer                                      |
|---|---|
| <b>* Animal RFID</b> 11483F4B               | <b>* Animal RFID</b> 11480AB9               |
| Species / Strain Rat / Sprague Dawley Sex ♂ | Species / Strain Rat / Sprague Dawley Sex ♂ |
| Additional Details                          | Additional Details                          |
| Surgeries RJVC                              | Surgeries RJVC                              |
| Soft Tissues                                | Soft Tissues                                |
| <b>* Surgeon RFID</b>                       | <b>* Closer RFID</b> Craig Jordan           |
| Start Time: 11:08:10                        | Start Time: 11:08:06                        |
| Stop Time: 00:00:00                         | Stop Time: 00:00:00                         |

- π Scan the animal
- π Record Times and Surgeons
- π Maintain Sterility



# Pi Surgical Suite – BW, Observations, and Patency Checks

Surgery - Animal Management: BioTech - Customer #11541 - UID-1001

### Animal Information

\* Animal RFID: 11483F4B

Vital Condition: Alive

### Surgical Card Information

\* Surgical Card RFID: E00401506C472679

### Surgical Operations

Customer: BioTech - Customer #11541  
Total Animals: 2 M 0 F 1 EM 0 EF  
Envigo #: Demo-1001  
Tattoo #: 0003  
Strain: Rat / Sprague Dawley  
Sex: Male  
D.O.B: 2017/09/04  
Procedure: RJVC, ROVX  
Surgery Date: 2017/09/08  
Ship Date: 2017/09/29  
Feed Type: 20185

### Clinical Score

| Surgery | Clinical Score |
|---------|----------------|
| RJVC    | 10 hearts      |
| ROVX    | 10 hearts      |

### Daily Observation

Acceptable  
 Other

Additional Details

### Patency Check

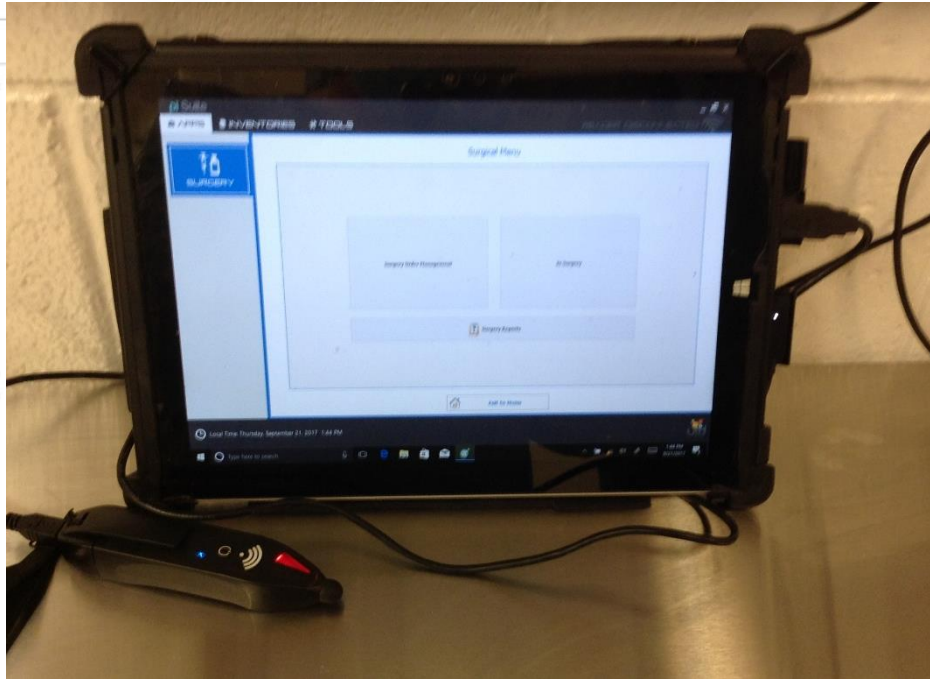
| Catheter | Patency   |
|----------|---|
| RJVC     | <input checked="" type="radio"/> Full <input type="radio"/> Partial <input type="radio"/> Blocked |

### Animal Body Weight

Weight: 24.19 g

#### Weighing Options

- Automatic Weight Capture
- Wait Interval (secs): 2
- Stable Weight Required
- Timeout (secs): 5



# Bodyweights, Patency, and Shipping



- π Record Bodyweights
- π Check Patency
- π Verify Shipping

# Pen and Paper Recording – Old Way

**Surgical Operations Wo**  
Site 237

Procedure Date: 7/27/17  
Surgical Procedure: JVC/PVC  
Surgical Code, if applicable: STDCATH  
Strain: SD Sex: MALE  
DOB: 6/9/17  
Requested Age/Weight: 220-250G

Isoflurane  
 Ketamine-Xylazine dose (mL): N/A  
 Ketoprofen or Buprenorphine dose (mL): 0.24  
Catheter Implantation Depth (mm):  
Catheter type/gauge: SAI-RJVC2.2-EV-10/SAI-PVC-EV-10  
Lock Solution: JVC-50.50/PVC-50.50  
Post Op Fluid(s)/q(s):

Quantity for order: 15 Extras 64  
Customer: XXXXXXXXXXXX  
Envigo #: 2020025-2826526  
Ship date: 7/31/17  
Catheter Lot #: RJVC22060117/PVC020317  
Closing Method: STANDARD

Start time: 7:11 End time: 7:36 Conditions: N/A  
Start time: 8:14 End time: 9:51  
Weight: 104g 130g

| Post-surgical Information |            |                  |                      |                   |            |            |       |      |                 |                |            |                        | Shipping Day   |            |                        |                |            |                        |                |          |    |
|---------------------------|------------|------------------|----------------------|-------------------|------------|------------|-------|------|-----------------|----------------|------------|------------------------|----------------|------------|------------------------|----------------|------------|------------------------|----------------|----------|----|
| DATE: <u>7/27/17</u>      | DATE:      | DATE:            | DATE: <u>7/31/17</u> |                   |            |            |       |      |                 |                |            |                        |                |            |                        |                |            |                        |                |          |    |
| Tech: <u>KC</u>           | Tech:      | Tech:            | Tech: <u>LC/JC</u>   |                   |            |            |       |      |                 |                |            |                        |                |            |                        |                |            |                        |                |          |    |
| Animal #                  | Weight (g) | Anesthetic Given | Eye Ointment Applied | Blood volume (ml) | PVC Screen | JVC Screen | Close | Prep | Surgery Results | Clinical Score | Weight (g) | Fluorescein (per cent) | Clinical Score | Weight (g) | Fluorescein (per cent) | Clinical Score | Weight (g) | Fluorescein (per cent) | Animal Shipped | Animal # |    |
| 1                         | 228        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | JC   | 1               | 01             | 215        |                        |                |            |                        |                | 27         | 232                    | CP1            | ✓        | 1  |
| 2                         | 229        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | JC   | 1               | 01             | 211        |                        |                |            |                        |                | 27         | 224                    | CP1            | ✓        | 2  |
| 3                         | 228        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 215        |                        |                |            |                        |                | 27         | 232                    | CP1            | ✓        | 3  |
| 4                         | 223        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 217        |                        |                |            |                        |                | 27         | 232                    | CP1            | ✓        | 4  |
| 5                         | 228        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 217        |                        |                |            |                        |                | 27         | 232                    | CP1            | ✓        | 5  |
| 6                         | 235        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 220        |                        |                |            |                        |                | 1          | 236                    | CP1            | ✓        | 6  |
| 7                         | 232        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 222        |                        |                |            |                        |                | 27         | 232                    | CP1            | ✓        | 7  |
| 8                         | 234        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 224        |                        |                |            |                        |                | 27         | 244                    | CP1            | ✓        | 8  |
| 9                         | 226        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 27             | 210        |                        |                |            |                        |                | 27         | 239                    | CP1            | ✓        | 9  |
| 10                        | 237        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 216        |                        |                |            |                        |                | 1          | 255                    | CP1            | ✓        | 10 |
| 11                        | 245        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 241        |                        |                |            |                        |                | 27         | 260                    | CP1            | ✓        | 11 |
| 12                        | 239        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 225        |                        |                |            |                        |                | 27         | 241                    | CP1            | ✓        | 12 |
| 13                        | 230        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 232        |                        |                |            |                        |                | 1          | 238                    | CP1            | ✓        | 13 |
| 14                        | 225        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 216        |                        |                |            |                        |                | 1          | 231                    | CP1            | ✓        | 14 |
| 15                        | 227        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 218        |                        |                |            |                        |                | 24         | 226                    | CP1            | ✓        | 15 |
| 16                        | 244        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 219        |                        |                |            |                        |                | 27         | 252                    | CP1            | ✓        | 16 |
| 17                        | 223        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 219        |                        |                |            |                        |                | 27         | 220                    | CP1            | ✓        | 17 |
| 18                        | 238        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 219        |                        |                |            |                        |                | X          | X                      | X              | X        | 18 |
| 19                        | 227        | ✓                | 0-0-0                |                   | GA         | EO         | EO    | LG   | 1               | 01             | 224        |                        |                |            |                        |                | 27         | 240                    | CP1            | ✓        | 19 |
| 20                        |            | ✓                | 0-0-0                |                   |            |            |       |      |                 |                |            |                        |                |            |                        |                |            |                        |                | ✓        | 20 |

OREC reviewed prior to use (initials): JC

all animals given ketoprofen #s 1-17, 19  
KC/JC



# Passive Data Recording – New Way

## Surgery History By Surgery Order



Order Number: 2873728

Customer Name: BioTech 1

Customer Email: [Info@biotech1.com](mailto:Info@biotech1.com)

Order Date: 2017-08-29

Required Date: 2017-09-02

Shipping Date: 2017-09-02

| ANIMAL RFID | ANIMAL # | SPECIES | SEX  | VITAL COND. | WEIGHT (G) | SURGEON NAME | SURGERY TYPE | SURGERY DATE | SUGERY DURATION | SHIPPED |
|-------------|----------|---------|------|-------------|------------|--------------|--------------|--------------|-----------------|---------|
| 11477C79    | 1        | Rat     | Male | Alive       | 347.65 g   | Surgeon 1    | RJVC         | 2017-08-30   | 692             | N/A     |
| 11483488    | 2        | Rat     | Male | Alive       | 346.15 g   | Surgeon 2    | RJVC         | 2017-08-30   | 323             | N/A     |
| 11486B2B    | 3        | Rat     | Male | Alive       | 361.60 g   | Surgeon 1    | RJVC         | 2017-08-30   | 656             | TRUE    |
| 11483F9A    | 4        | Rat     | Male | Alive       | 309.75 g   | Surgeon 2    | RJVC         | 2017-08-30   | 646             | TRUE    |
| 1147F1AF    | 5        | Rat     | Male | Alive       | 350.75 g   | Surgeon 1    | RJVC         | 2017-08-30   | 470             | N/A     |
| 11486B63    | 6        | Rat     | Male | Alive       | 314.65 g   | Surgeon 2    | RJVC         | 2017-08-30   | 525             | TRUE    |
| 11477DBE    | 7        | Rat     | Male | Dead        | 350.40 g   | Surgeon 1    | RJVC         | 2017-08-30   | 428             | N/A     |
| 11477039    | 8        | Rat     | Male | Alive       | 356.05 g   | Surgeon 2    | RJVC         | 2017-08-30   | 647             | TRUE    |
| 11487D02    | 9        | Rat     | Male | Alive       | 339.00 g   | Surgeon 1    | RJVC         | 2017-08-30   | 344             | TRUE    |
| 11480B68    | 10       | Rat     | Male | Alive       | 333.35 g   | Surgeon 2    | RJVC         | 2017-08-30   | 9               | TRUE    |

LAST ROW

Records Count: 10

# Data for Surgical Times

YTD Surgeries 840 of 10,000

0K 1K 2K 3K 4K 5K 6K 7K 8K 9K

Shipped XXX of 840 -- YY% Shipped

0K 1K 2K 3K 4K 5K 6K 7K 8K 9K

Euthanized in Surgery - xxx of 840

0K 1K 2K 3K 4K 5K 6K 7K 8K 9K

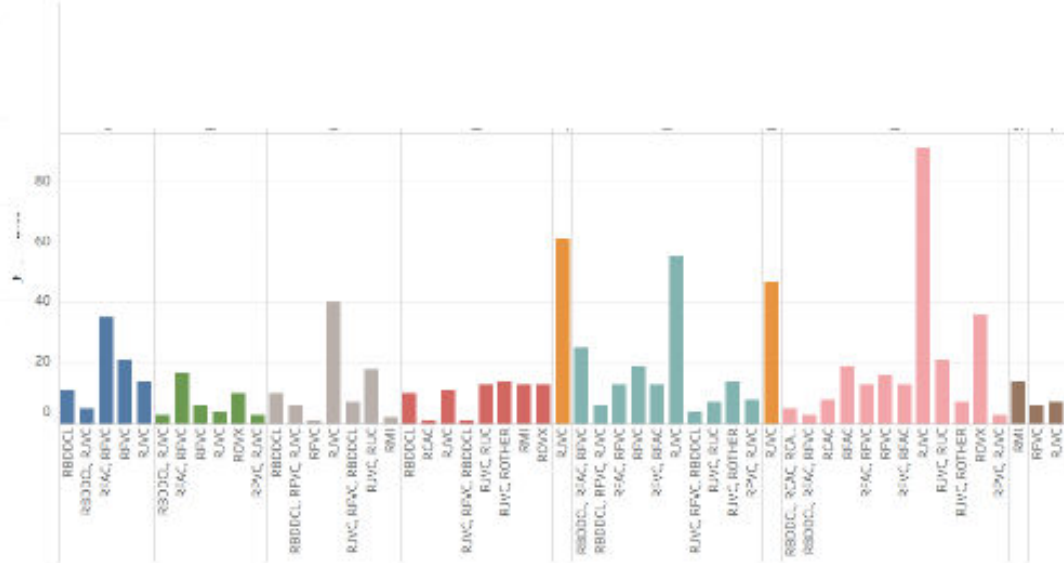
Extras SOLD xxx of 840

0K 1K 2K 3K 4K 5K 6K 7K 8K 9K

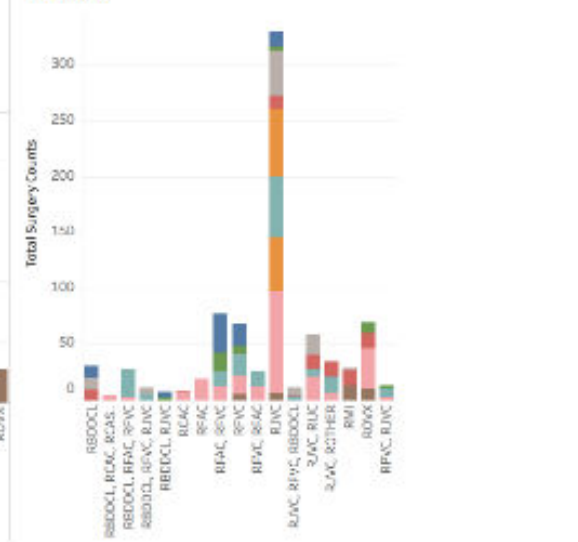
RMS YTD  
Average Surgery Times

| Combo Surgery Codes  | YTD      |
|----------------------|----------|
| RBDDCL, RCAC, RCASTR | 00:00:51 |
| ROVX                 | 00:04:13 |
| RFVC                 | 00:05:16 |
| RFAC                 | 00:07:00 |
| RJVC                 | 00:07:04 |
| RJVC, ROTHER         | 00:07:21 |
| RFVC, RFAC           | 00:08:22 |
| RFAC, RFVC           | 00:09:46 |
| RCAC                 | 00:10:01 |
| RBDDCL, RFAC, RFVC   | 00:10:40 |
| RBDDCL               | 00:11:11 |
| RMI                  | 00:14:08 |
| RJVC, RUC            | 00:15:07 |
| RBDDCL, RFVC, RJVC   | 00:22:00 |
| RFVC, RJVC           | 00:22:14 |
| RJVC, RFVC, RBDDCL   | 00:25:05 |
| RBDDCL, RJVC         | 00:26:00 |

YTD-Total Surgeries by "Surgeon then Type"



YTD-Surgerys by "Type & Surgeon in (COLOR)"



YTD-Surgeries Totals by Surgeon

| Combo Surgery Codes  | Surgeon 1 | Surgeon 2 | Surgeon 3 | Surgeon 4 | Surgeon 5 | Surgeon 6 | Surgeon 7 | Surgeon 8 | Surgeon 9 |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| RBDDCL               | 11        |           |           | 10        | 10        |           |           |           |           |
| RBDDCL, RCAC, RCASTR | 5         |           |           |           |           |           |           |           |           |
| RBDDCL, RFAC, RJVC   | 25        | 3         |           |           |           |           |           |           |           |
| RBDDCL, RFVC, RJVC   | 6         |           |           | 6         |           |           |           |           |           |
| RBDDCL, RJVC         |           | 5         | 3         |           |           |           |           |           |           |
| RCAC                 | 8         |           |           |           |           | 1         |           |           |           |
| RFAC                 | 19        |           |           |           |           |           |           |           |           |
| RFAC, RFVC           | 13        | 13        | 35        | 17        |           |           |           |           |           |
| RFVC                 | 19        | 16        | 21        | 6         | 1         |           |           | 6         |           |
| RFVC, RFAC           | 13        | 13        |           |           |           |           |           |           |           |
| RJVC                 | 53        | 91        | 14        | 4         | 40        | 11        | 61        | 47        | 7         |
| RJVC, RFVC, RBDDCL   | 4         |           |           |           | 7         | 1         |           |           |           |
| RJVC, RUC            | 7         | 21        |           |           | 16        | 13        |           |           |           |
| RJVC, ROTHER         | 14        | 7         |           |           | 14        |           |           |           |           |
| RMI                  |           |           |           |           | 2         | 13        |           |           | 14        |
| ROVX                 | 36        |           |           | 10        | 13        |           |           |           | 11        |
| RFVC, RJVC           | 8         | 3         |           | 3         |           |           |           |           |           |

Average Surgery Time by Surgeon (HR:MIN:SEC)

| Combo Surgery Codes  | Surgeon 1 | Surgeon 2 | Surgeon 3 | Surgeon 4 | Surgeon 5 | Surgeon 6 | Surgeon 7 | Surgeon 8 | Surgeon 9 |
|----------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| RBDDCL               | 00:13:33  |           | 00:11:17  | 00:14:48  |           |           |           |           |           |
| RBDDCL, RCAC, RCASTR |           |           |           |           |           |           |           |           | 00:00:51  |
| RBDDCL, RFAC, RFVC   |           |           |           |           |           |           | 00:11:03  |           | 00:09:04  |
| RBDDCL, RFVC, RJVC   |           |           | 00:18:15  |           |           |           | 00:25:45  |           |           |
| RBDDCL, RJVC         | 00:24:56  | 00:27:47  |           |           |           |           |           |           |           |
| RCAC                 |           |           |           | 00:07:03  |           |           |           |           | 00:10:23  |
| RFAC                 |           |           |           |           |           |           |           |           | 00:07:00  |
| RFAC, RFVC           | 00:07:49  | 00:15:14  |           |           |           | 00:07:26  |           |           | 00:10:12  |
| RFVC                 | 00:04:18  | 00:05:19  | 00:00:05  |           |           | 00:05:17  |           | 00:06:55  | 00:05:57  |
| RFVC, RFAC           |           |           |           |           |           | 00:08:40  |           |           | 00:08:03  |
| RJVC                 | 00:07:49  | 00:10:34  | 00:04:39  | 00:08:35  | 00:09:14  | 00:07:05  | 00:04:23  | 00:07:28  | 00:08:00  |
| RJVC, RFVC, RBDDCL   |           |           | 00:17:31  | 00:36:39  |           | 00:35:28  |           |           |           |
| RJVC, RUC            |           |           | 00:11:41  | 00:15:39  |           | 00:15:06  |           |           | 00:17:44  |
| RJVC, ROTHER         |           |           | 00:06:19  |           |           | 00:07:31  |           |           | 00:09:06  |
| RMI                  |           |           | 00:18:03  | 00:13:39  |           |           |           |           | 00:14:04  |
| ROVX                 |           | 00:05:40  | 00:03:57  |           |           |           |           | 00:03:47  | 00:04:40  |
| RFVC, RJVC           |           | 00:29:19  |           |           |           | 00:21:08  |           | 00:18:06  |           |





# RFID Surgical Data Collection

## Results using RFID in Surgery from 2 months of data collection

- π Significant animal reduction
- π Inventory usage reduction
- π Paperless data recording in Surgery
- π Surgeon training and optimization
- π Improved Customer interactions

# Advantages to YOU the Researcher

- π Data Starts at the Animal Supplier
- π All Data is Valuable and can be provided to YOU
- π Show Drugs or items were or were NOT given
- π Positively ID the Animal – Customer Programmable Microchip
- π Your Research can Start Easier, Faster, and 100% Accurate

# Easy Import of Collected Data From Animal Provider

Provided by the Surgical Vendor

## Surgery History By Surgery Order

Order Number: 2873728  
Customer Name: BioTech 1  
Customer Email: [info@biotech1.com](mailto:info@biotech1.com)

Order Date: 2017-08-29  
Required Date: 2017-09-02  
Shipping Date: 2017-09-02



| ANIMAL RFID | ANIMAL# | SPECIES | SEX  | VITAL COND. | WEIGHT (G) | SURGEON NAME | SURGERY TYPE | SURGERY DATE | SUGERY DURATION | SHIPPED |
|-------------|---------|---------|------|-------------|------------|--------------|--------------|--------------|-----------------|---------|
| 11477C79    | 1       | Rat     | Male | Alive       | 347.65 g   | Surgeon 1    | RJVC         | 2017-08-30   | 692             | N/A     |
| 11483488    | 2       | Rat     | Male | Alive       | 346.15 g   | Surgeon 2    | RJVC         | 2017-08-30   | 323             | N/A     |
| 11486B2B    | 3       | Rat     | Male | Alive       | 361.60 g   | Surgeon 1    | RJVC         | 2017-08-30   | 656             | TRUE    |
| 11483F9A    | 4       | Rat     | Male | Alive       | 309.75 g   | Surgeon 2    | RJVC         | 2017-08-30   | 646             | TRUE    |
| 1147F1AF    | 5       | Rat     | Male | Alive       | 350.75 g   | Surgeon 1    | RJVC         | 2017-08-30   | 470             | N/A     |
| 11486B63    | 6       | Rat     | Male | Alive       | 314.65 g   | Surgeon 2    | RJVC         | 2017-08-30   | 525             | TRUE    |
| 11477DBE    | 7       | Rat     | Male | Dead        | 350.40 g   | Surgeon 1    | RJVC         | 2017-08-30   | 428             | N/A     |
| 11477039    | 8       | Rat     | Male | Alive       | 356.05 g   | Surgeon 2    | RJVC         | 2017-08-30   | 647             | TRUE    |
| 11487D02    | 9       | Rat     | Male | Alive       | 339.00 g   | Surgeon 1    | RJVC         | 2017-08-30   | 344             | TRUE    |
| 11480B68    | 10      | Rat     | Male | Alive       | 333.35 g   | Surgeon 2    | RJVC         | 2017-08-30   | 9               | TRUE    |



Your Laboratory Information Management System



Records Count: 10

LAST ROW

# Efficiency is Key for the Three R's

Relying on hand written paper notes is not effective.

- π Data Collection Starts with the Animals ID/Microchip from the Supplier
- π RFID Readers that Work with the Process – Not Interfere
- π Add RFID Cage Cards, Vial Labels, Item Labels, and even Technicians!
- π Software Written for the EXACT Process You Require.

# Other Processes where RFID Can Eliminate Pen and Paper and Streamline Work Flow

## π Animal Dosing and TK Sampling

- ∞ Verify Dose, Time Points, Sample Vials, and Automatically Record Times

## π Cage Sanitation

- ∞ Track Caging Inventory, Location, Sanitation Records, Maintenance,

## π Body weighing

- ∞ Simply Scan the Animal and place it on the Scale. The software records everything: Animal Number, Sex, Strain, Species, Date, Tech, Bodyweights and More!

## π Inventory and assets

- ∞ Track all your assets and automatically send emails for calibrations!

# RFID and Data Collection

- π RFID Is Proven Technology in the laboratory space
- π Customized software solutions to enhance your process
- π Clean, Accurate, and Electronically Captured Data
- π Start your data collection at the Animal Supplier

Replace your Pen and paper to Refine your data collection process while Reducing your work load and animal usage with better data collection. RFID.

# Questions

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Thank you to Brad Gien at Envigo and his Surgical Team for the data presented.





IDENTIFICATION  
SOLUTIONS

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