APPENDIX 1

Select the boxes

Waste

Value add

Boxes wait the request in the storage	List operation- box ready	The empty case carts are taken in the storage by S1 and S2	read the list of first box	Case cart empty is moved	Box are taken and put in the case cart	Necessity of other boxes

Case cart Is moved again

OR

Case cart remains in the same place (wait)

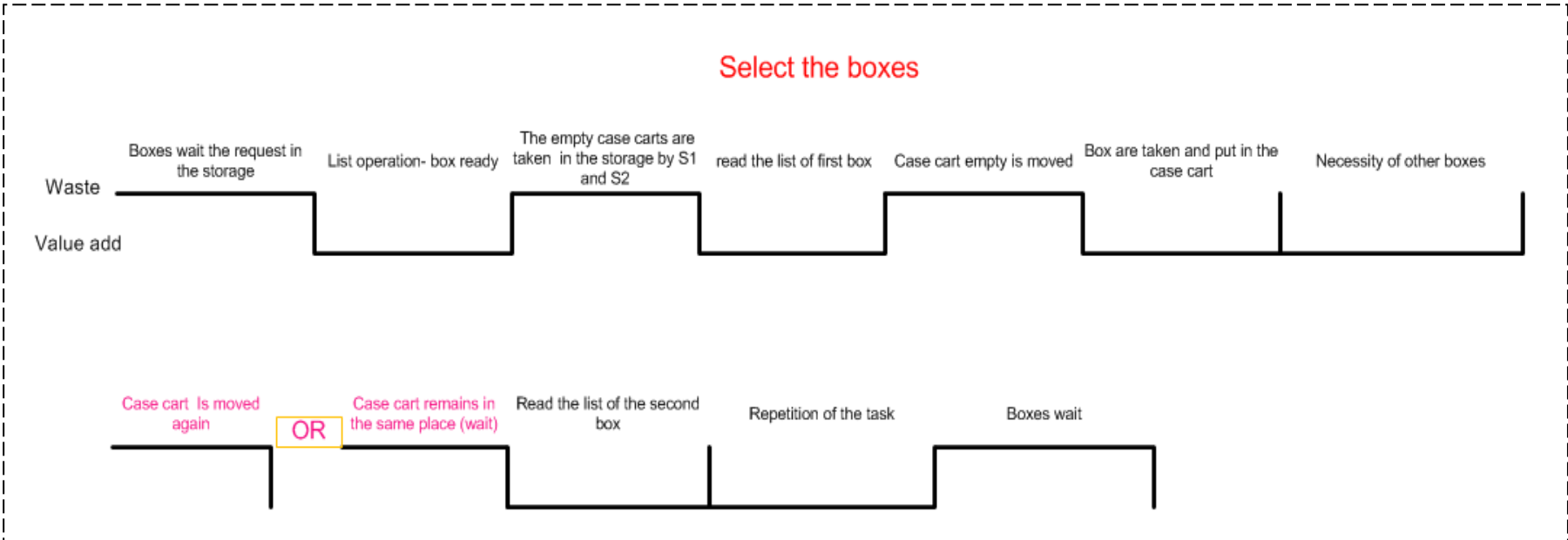Read the list of the second box

Repetition of the task

Boxes wait

Use the instruments

Nurse opens the boxes and each instrument is put on the table

Surgical operation (medicals uses the instruments)

Instruments are inserted again in the boxes

Boxes moved

Case cart is filled

Movement of the case cart to the area of cleaning
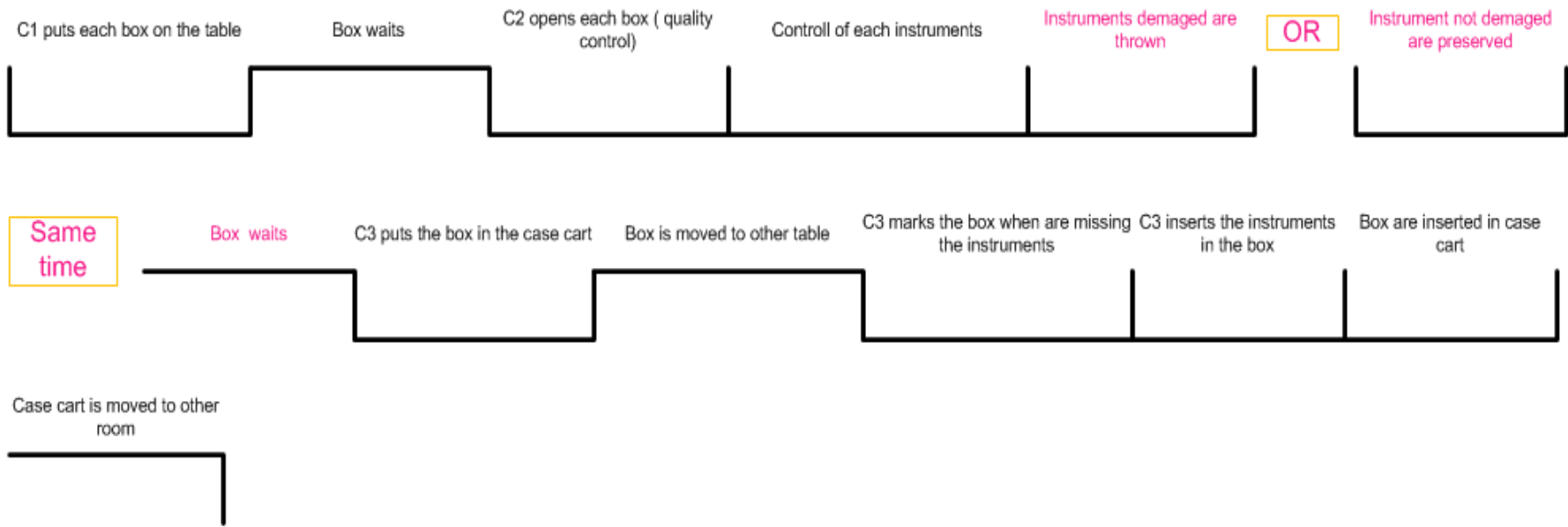
Case cart waits

S4 takes the case cart
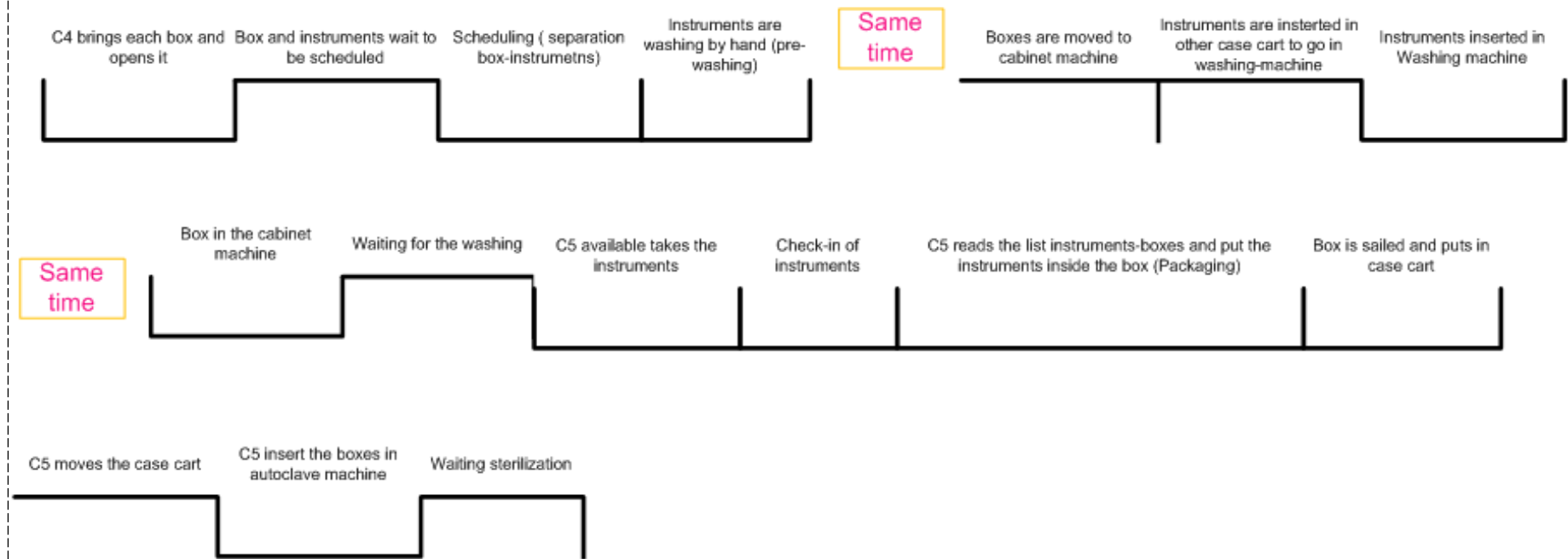
Case cart is moved to the elevator

call elevator

Wait the elevator

Case cart is moved to CSSD

Quality control

C1 puts each box on the table

Box waits

C2 opens each box (quality control)

Controll of each instruments

Instruments demaged are thrown

OR

Instrument not demaged are preserved

Same time

Box waits

C3 puts the box in the case cart

Box is moved to other table

C3 marks the box when are missing the instruments

C3 inserts the instruments in the box

Box are inserted in case cart

Case cart is moved to other room

Cleaning of instruments

C4 brings each box and opens it

Box and instruments wait to be scheduled

Scheduling (separation box-instrumetns)

Instruments are washing by hand (pre-washing)

Same time

Boxes are moved to cabinet machine

Instruments are insterted in other case cart to go in washing-machine

Instruments inserted in Washing machine

Same time

Box in the cabinet machine

Waiting for the washing

C5 available takes the instruments

Check-in of instruments

C5 reads the list instruments-boxes and put the instruments inside the box (Packaging)

Box is sailed and puts in case cart

C5 moves the case cart

C5 insert the boxes in autoclave machine

Waiting sterilization

Storage of the instruments

Case cart is moved to Storage place

S1 takes the case cart. he reads the list of position of boxes

Case cart is moved

Box is inserted on the floor

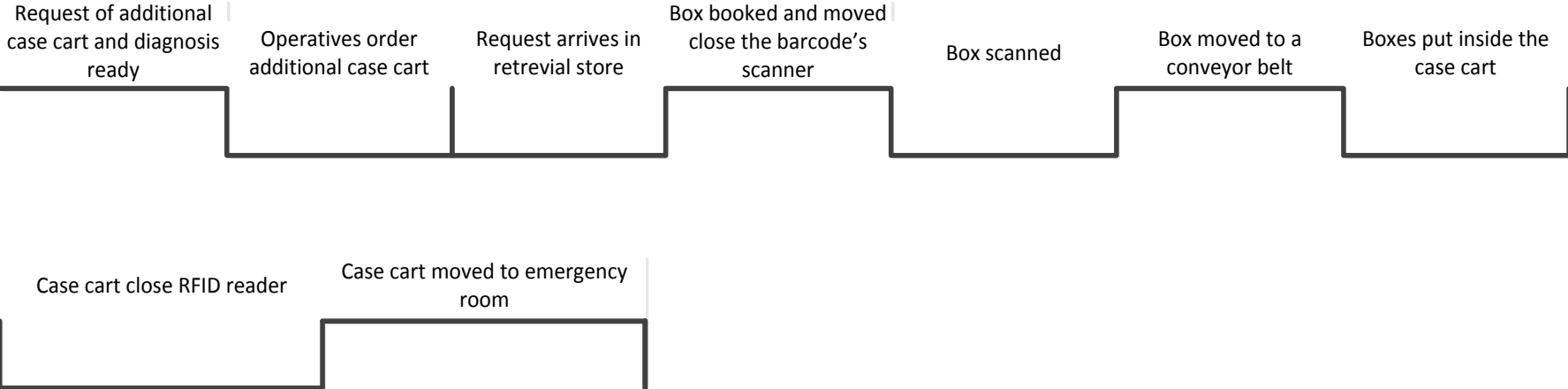S1 reads the position of other box

He moves the case cart

OR

Case cart waits in the same positions

Reposition of all boxes

Boxes wait a new request to be taken out.

APPENDIX 2

Second scenario: request of additional boxes in retrevial store

Request of additional case cart and diagnosis ready

Operatives order additional case cart

Request arrives in retrevial store

Box booked and moved close the barcode's scanner

Box scanned

Box moved to a conveyor belt

Boxes put inside the case cart

Case cart close RFID reader

Case cart moved to emergency room

Emergency room

Case cart in emergency room — Case cart close a RFID reader — Case cart scanned — Case cart moved to operation theatre

Use additional and base boxes: operation theatre

Additional case cart arrives in operation theatre — Additional case cart emptied — Additional and base boxes are scanned — Case 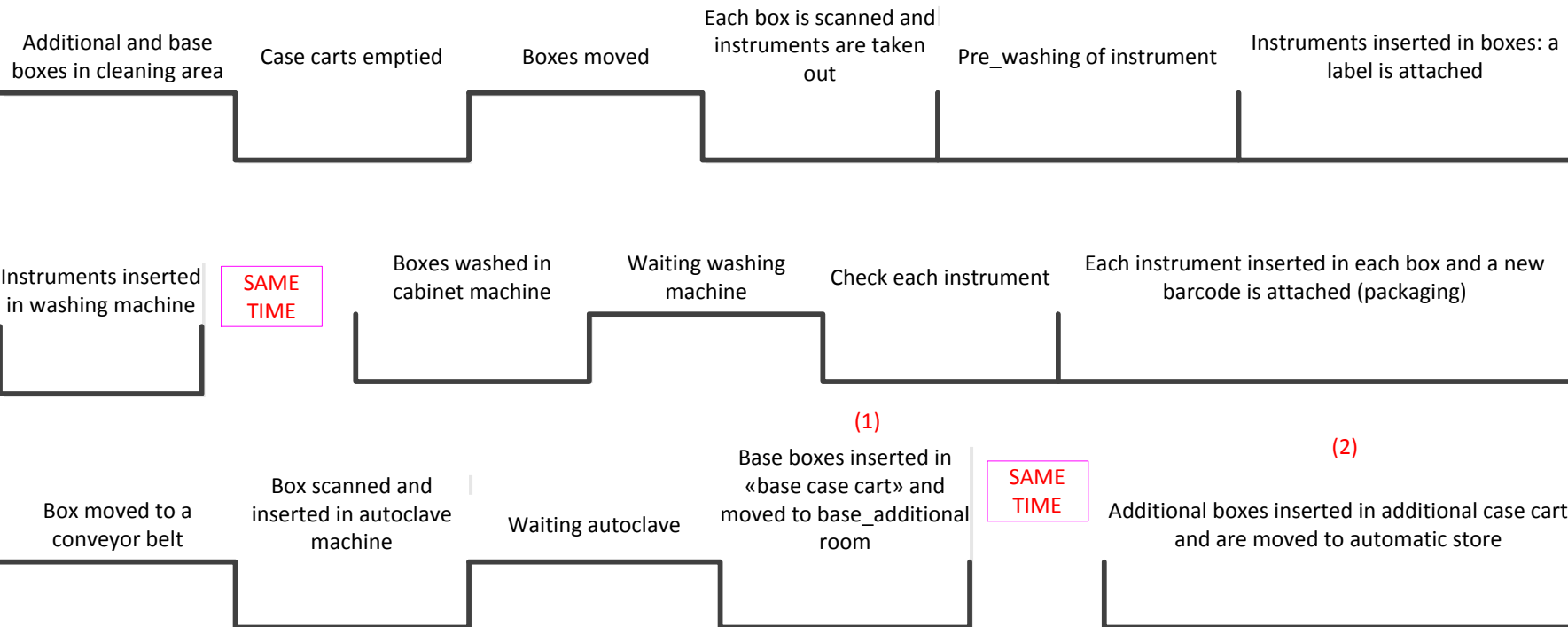carts wait in the conrner — Surgical operation — Additional and base single use instruments are thrown and exit from the system
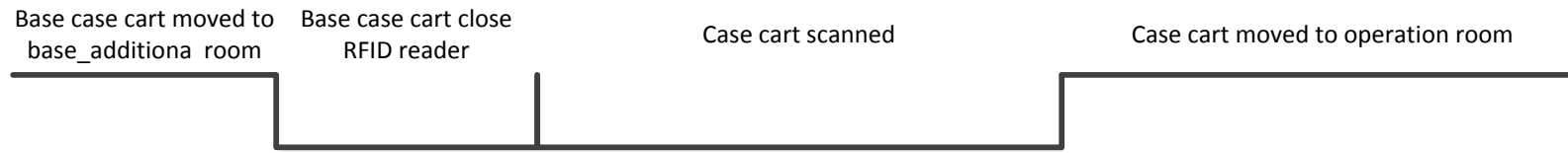
Boxes filled and moved to own case cart — Case carts filled — Case carts moved to the area of cleaning
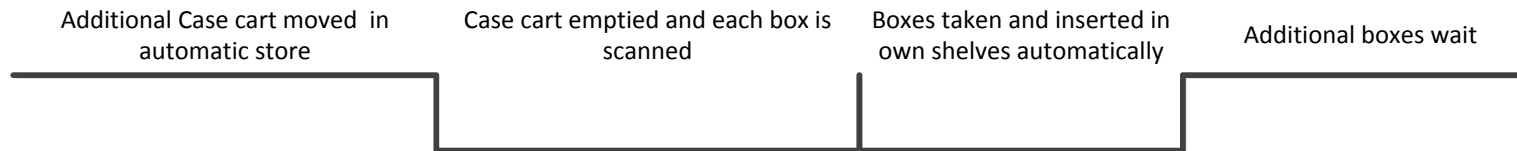
Cleaning area: additional and base case cart

Additional and base boxes in cleaning area → Case carts emptied → Boxes moved → Each box is scanned and instruments are taken out → Pre_washing of instrument → Instruments inserted in boxes: a label is attached

Instruments inserted in washing machine **SAME TIME** → Boxes washed in cabinet machine → Waiting washing machine → Check each instrument → Each instrument inserted in each box and a new barcode is attached (packaging)

(1)

Box moved to a conveyor belt → Box scanned and inserted in autoclave machine → Waiting autoclave → Base boxes inserted in «base case cart» and moved to base_additional room **SAME TIME** → **(2)** Additional boxes inserted in additional case cart and are moved to automatic store

First scenario : request of base case cart:
base_additional room (1)

Base case cart moved to base_additiona room

Base case cart close RFID reader

Case cart scanned

Case cart moved to operation room

Store of additional boxes (2)

Additional Case cart moved in automatic store

Case cart emptied and each box is scanned

Boxes taken and inserted in own shelves automatically

Additional boxes wait

Third scenario: request of plan case cart

Request sent in automatic store	Boxes booked through a computer	Boxes moved close a computer	Boxes scanned	Boxes moved to a conveyor	Boxes inserted in a case cart

Case cart moved to RFID	RFID reader	Case cart moved to the plan room

Plan room

Case cart arrives in this room	Case cart passed close a RFID reader	Case cart moved to the area of operation theatre
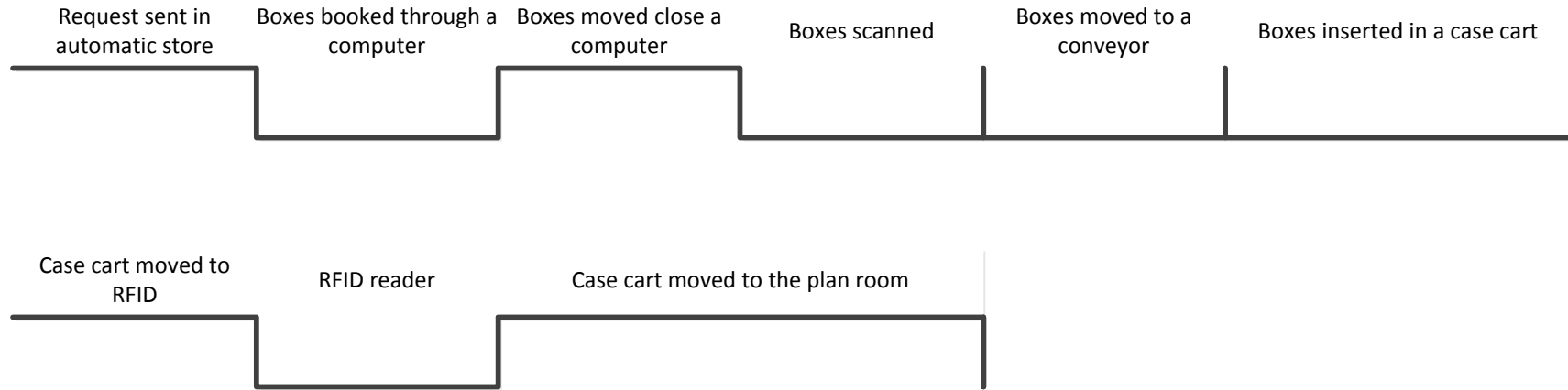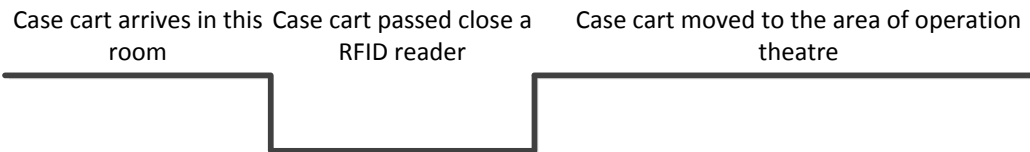
Use instruments in operation theatre

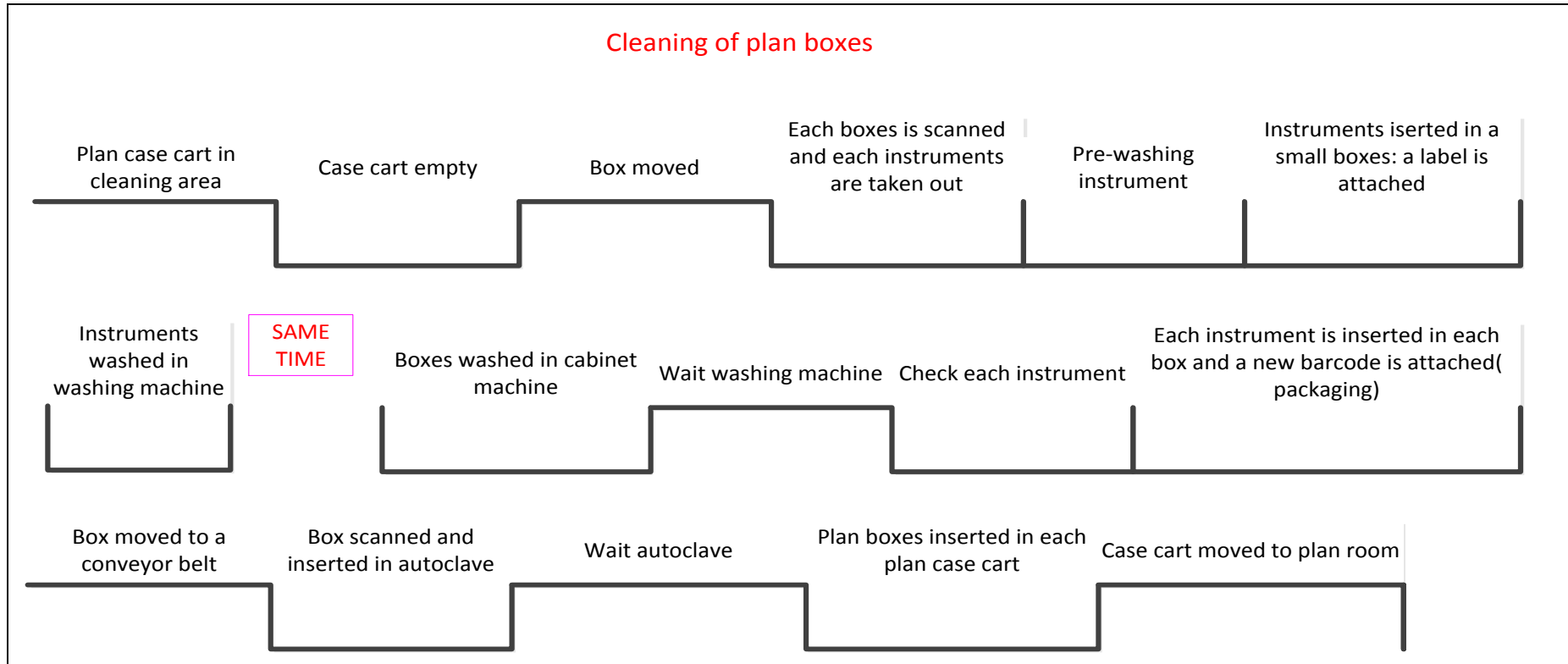| Case carts arrives in operation theatre	Case cart is emptied	Boxes scanned	Surgical operation	Boxes scanned and single use instrument are thrown

Boxes filled and inserted in case cart	Case cart moved to cleaning area

Cleaning of plan boxes

Plan case cart in cleaning area → Case cart empty → Box moved → Each boxes is scanned and each instruments are taken out → Pre-washing instrument → Instruments iserted in a small boxes: a label is attached

Instruments washed in washing machine

SAME TIME

Boxes washed in cabinet machine → Wait washing machine → Check each instrument → Each instrument is inserted in each box and a new barcode is attached(packaging)

Box moved to a conveyor belt → Box scanned and inserted in autoclave → Wait autoclave → Plan boxes inserted in each plan case cart → Case cart moved to plan room

Store plan boxes in automatic store

Plan case cart arrives in automatic store

Case cart emptied and each box is scanned

Boxes taken and inserted in own shelves automatically

Plan boxes boxes wait