

# DRUG ERROR: EPHEDRINE BOLUS

MODULE: PATIENT SAFETY

TARGET: ALL ANAESTHETISTS

**BACKGROUND:**

Medication errors present a particular hazard to patients. Anaesthetists handle and administer numerous drugs with potentially significant adverse effects, often in a distraction-filled environment. There has been a relatively poor safety culture with regard to drug error prevention in anaesthesia although this is improving.

**RELEVANT AREAS OF THE ANAESTHETIC CURRICULUM**

|          |  |
|----------|--|
| IG_BS_04 | Demonstrates safe practice in selecting, checking, drawing up, diluting, labelling and administering of drugs  |
| IG_BS_10 | <p>In respect of airway management:</p> <ul style="list-style-type: none"> <li>• Demonstrates optimal patient position for airway management</li> <li>• Manages airway with mask and oral/nasopharyngeal airways</li> <li>• Demonstrates hand ventilation with bag and mask</li> <li>• Able to insert and confirm placement of a Laryngeal Mask Airway</li> <li>• Demonstrates correct head positioning, direct laryngoscopy and successful nasal/oral intubation techniques and confirms correct tracheal tube placement</li> <li>• Demonstrates proper use of bougies</li> <li>• Demonstrates correct securing and protection of LMAs/tracheal tubes during movement, positioning and transfer</li> <li>• Correctly conducts RSI sequence</li> <li>• Correctly demonstrates the technique of cricoid pressure</li> </ul> |
| IO_BS_08 | Communicates with the theatre team in a clear unambiguous style  |
| IO_BS_09 | Able to respond in a timely and appropriate manner to events that may affect the safety of patients [e.g. hypotension, massive haemorrhage][S]   |
| ES_BS_03 | Manages rapid sequence induction in the high risk situation of emergency surgery for the acutely ill patient   |
| CI_BK_09 | Unexpected hypertension  |
| CI_BK_11 | <p>Arrhythmias:</p> <ul style="list-style-type: none"> <li>• ST segment changes</li> <li>• Sudden bradycardia</li> <li>• Ventricular ectopics</li> </ul>   |
| CI_BK_22 | Adverse drug reactions   |
| CI_BS_01 | Demonstrates good non-technical skills such as: [effective communication, team-working, leadership, decision-making and maintenance of high situation awareness]   |
| CI_BS_02 | Demonstrates the ability to recognise early a deteriorating situation by careful monitoring  |
| CI_BS_03 | Demonstrates the ability to respond appropriately to each incident listed above  |
| CI_BS_04 | Shows how to initiate management of each incident listed above   |
| CI_BS_05 | Demonstrates ability to recognise when a crisis is occurring   |
| CI_BS_06 | Demonstrates how to obtain the attention of others and obtain appropriate help when a crisis is occurring  |
| CI_IS_01 | Demonstrates leadership in resuscitation room/simulation when practicing response protocols with other healthcare professionals  |
| CI_IS_02 | Demonstrates appropriate use of team resources when practicing response protocols with other healthcare professionals  |

## INFORMATION FOR FACULTY

### LEARNING OBJECTIVES:

- Learn how to approach the management of unexpected hypertension under anaesthesia
- Understand the factors that can contribute to drug errors occurring
- Understand how systems can be put in place to reduce the risk of harm to patients from drug errors

### SCENE INFORMATION:

- Location: Anaesthetic Room / Theatre
- Expected Duration of Scenario: 20 mins
- Expected Duration of Debrief: 40 mins

### EQUIPMENT & CONSUMABLES

Manikin  
 Stocked airway trolley  
 Simulated drugs for induction (thiopentone/propofol, suxamethonium, fentanyl, atracurium), anti-emesis (ondansetron, dexametasone), analgesia (paracetamol, diclofenac, tramadol) antibiotics (augmentin, gentamicin), emergency (suxamethonium, atropine, metaraminol, ephedrine)  
 Empty Ephedrine vial (30mg in 1ml)  
 Surgical drapes  
 Simulated surgical equipment (e.g. instrument trolley, diathermy, suction etc)

### PERSONS REQUIRED

Anaesthetic Junior Trainee  
 Anaesthetic Assistant  
 Anaesthetic Senior Trainee  
 Scrubs Nurse (Optional)  
 Surgeon (Optional)  
 Runner (Optional)

### PARTICIPANT BRIEFING: (TO BE READ ALOUD TO PARTICIPANT)

You are coming on shift to start a night shift and are taking over the care of the anaesthetic.

Please take over the anaesthetic care of the patient for their extubation and transfer to the recovery area.

### 'VOICE OF MANIKIN' BRIEFING:

No speech. Anaesthetised.

### 'IN SCENARIO PERSONNEL' BRIEFING:

#### OUT-GOING ANAESTHETIST

You have been the emergency list anaesthetist during daylight hours. You are tired and irritated as this case has gone on much longer than planned, and there are several cases now stacked up and are waiting to be done. You are keen to handover quickly – if asked why, say that you've needed the loo for the last hour and the case has gone on much longer than expected.

Handover the information in character as described below:

Thanks for taking over the anaesthetic for this patient. He is James Davidson, 42 year old patient who has had an appendicectomy. They are usually fit and well, but have had 5 days of right iliac fossa pain, with vomiting and fevers. They had a raised white cell count and CRP.

The patient is fasted, but has had vomiting in the last 2 hours. There are no allergies known. He is a heavy smoker – admits to 20-30/day but looks like he may smoke more. Their airway examination is unremarkable. Chest examination had scattered creps throughout. He's not previously been diagnosed as COPD.

His induction was an unremarkable RSI, but he was pyrexial and tachycardic preoperatively. He was given antibiotics on induction, but once they opened up and saw how much contamination there was from the perforation he was given additional gentamicin. He's also required quite a few boluses of metaraminol through the case.

It's been a very prolonged case. The operation started laparoscopically, but there was perforated and retrocaecal and due to technical difficulties was converted to open. There was some hypotension during the procedure and the patient has required several doses of metaraminol intraoperatively. In addition, an arterial line was inserted at the time of converting to open procedure.

The operation and the surgeon has just finishing suturing. You were planning to give some ondansetron and a further 5mg morphine before he wakes up and will likely need another 10mg in recovery. He'll need reversal as some atracurium was given a short while ago as he coughed on the table.

#### SURGICAL TEAM

The laparoscopic appendicectomy has proceeded uneventfully and you are just finishing suturing and dressing the wounds. After finishing suturing, you can leave theatre. Announce that you will be writing the op note in the coffee room.

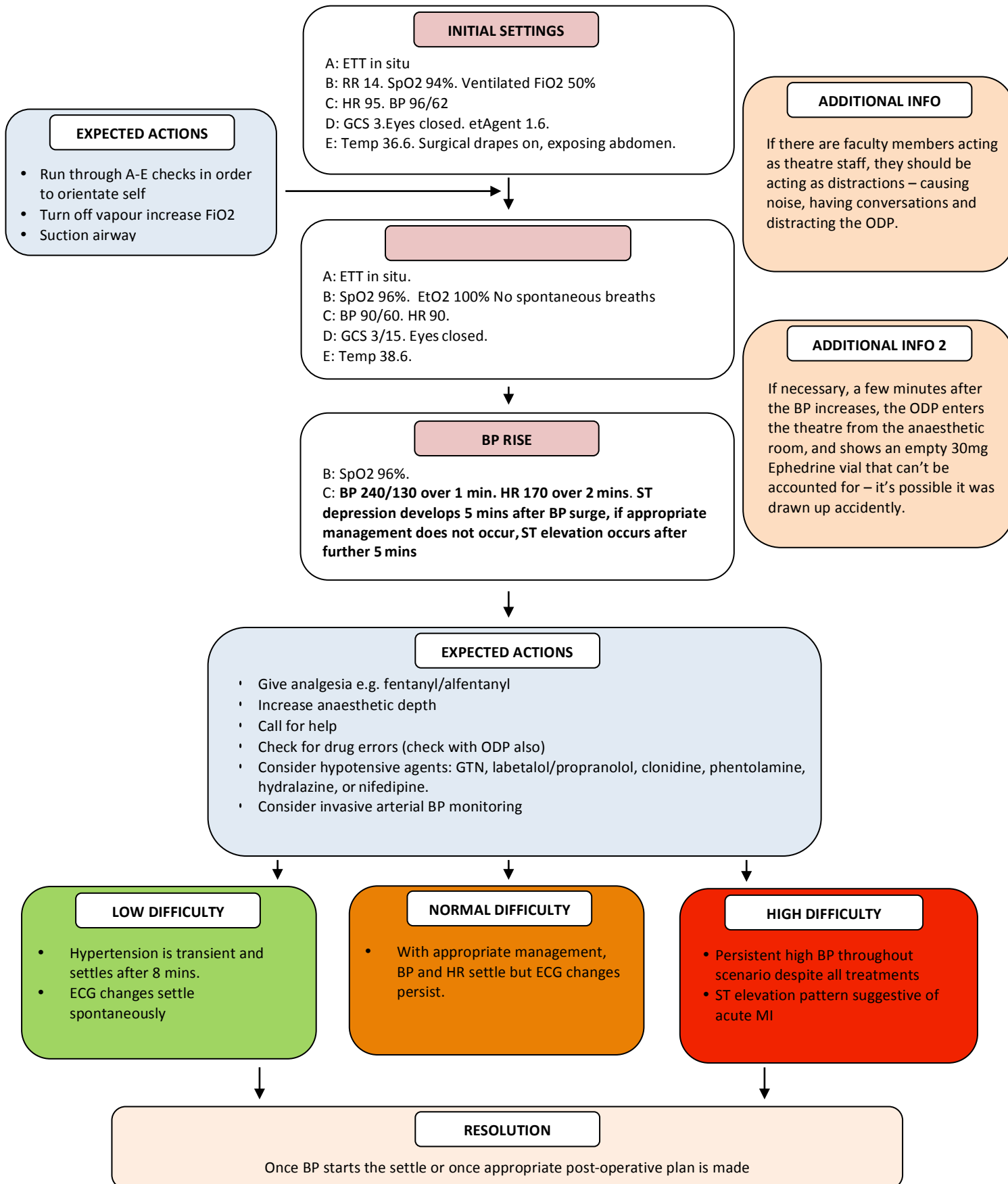
#### ANAESTHETIC ASSISTANT

The operation has finished and the patient needs to be extubated and transferred to recovery.

The patient is a bit slow to breathe and will require reversal of muscle relaxation. Hand them an unlabelled 2ml syringe with 1ml of clear fluid and tell them you've just drawn up the reversal – OR – this can be a labelled syringe that the outgoing anaesthetist drew up alongside some ondansetron and pain relief.

If administered, this leads to a drug error.

CONDUCT OF SCENARIO



# ANAESTHETIC RECORD SHEET



**PATIENT DETAILS / ADDRESSOGRAPH**  
 Hospital No. \_\_\_\_\_

SURNAME: James Davidson  
 (Block Letters)

FORENAMES: 44 years old

Address: \_\_\_\_\_  
 Ward/Hosp: \_\_\_\_\_

DOB: \_\_\_\_\_ Sex: M / F

Procedure(s) proposed:  
**Laparoscopic → Open Appendicectomy**

CEPOD CLASS: ELECTIVE / SCHEDULED / URGENT / EMERGENCY

**Anaesthetist's preoperative assessment by**

Name: \_\_\_\_\_ Grade:  Cons  AS  SG  Trainee \_\_\_\_\_

Date: \_\_\_\_\_ Time: \_\_\_\_\_ Signature \_\_\_\_\_

|  |  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
|--|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--|
| <p><b>Anaes / Surg history:</b></p> <p>No previous GAs</p> <p><b>Medical history:</b></p> <p>No medical history of note</p> <p>5 days of pain, 2 days of vomiting and fevers<br/>Vomited 2 hours ago</p> <p>Heavy smoker – 20-30/day</p> <p>VTE Risk: <input type="checkbox"/> High <input type="checkbox"/> Low</p> <p><b>NBM since</b> Solids: Fasted for 6 hrs<br/>                 Clear Fluids: _____</p> <p>Pregnancy: _____<br/>                 Lactation: _____</p> | <p><b>O/E</b></p> <p>Pyrexial 38.5 Looks unwell.</p> <p>Tachycardia 110</p> <p>Chest – scattered creps</p> <p style="text-align: center;"><b>Airway Assessment</b></p> <p>Mouth Opening:<br/>                 MP Score: 1 2 3 4</p> <p>Jaw: Good mouth opening<br/>                 Neck: Neck ROM OK</p> <p style="text-align: center;">TEETH</p> <table style="margin: auto; border-collapse: collapse;"> <tr> <td style="border-right: 1px solid black; padding: 2px 5px;">8</td><td style="border-right: 1px solid black; padding: 2px 5px;">7</td><td style="border-right: 1px solid black; padding: 2px 5px;">6</td><td style="border-right: 1px solid black; padding: 2px 5px;">5</td><td style="border-right: 1px solid black; padding: 2px 5px;">4</td><td style="border-right: 1px solid black; padding: 2px 5px;">3</td><td style="border-right: 1px solid black; padding: 2px 5px;">2</td><td style="border-right: 1px solid black; padding: 2px 5px;">1</td> <td style="border-right: 1px solid black; padding: 2px 5px;">1</td><td style="border-right: 1px solid black; padding: 2px 5px;">2</td><td style="border-right: 1px solid black; padding: 2px 5px;">3</td><td style="border-right: 1px solid black; padding: 2px 5px;">4</td><td style="border-right: 1px solid black; padding: 2px 5px;">5</td><td style="border-right: 1px solid black; padding: 2px 5px;">6</td><td style="border-right: 1px solid black; padding: 2px 5px;">7</td><td style="padding: 2px 5px;">8</td> </tr> <tr> <td style="border-right: 1px solid black; padding: 2px 5px;">8</td><td style="border-right: 1px solid black; padding: 2px 5px;">7</td><td style="border-right: 1px solid black; padding: 2px 5px;">6</td><td style="border-right: 1px solid black; padding: 2px 5px;">5</td><td style="border-right: 1px solid black; padding: 2px 5px;">4</td><td style="border-right: 1px solid black; padding: 2px 5px;">3</td><td style="border-right: 1px solid black; padding: 2px 5px;">2</td><td style="border-right: 1px solid black; padding: 2px 5px;">1</td> <td style="border-right: 1px solid black; padding: 2px 5px;">1</td><td style="border-right: 1px solid black; padding: 2px 5px;">2</td><td style="border-right: 1px solid black; padding: 2px 5px;">3</td><td style="border-right: 1px solid black; padding: 2px 5px;">4</td><td style="border-right: 1px solid black; padding: 2px 5px;">5</td><td style="border-right: 1px solid black; padding: 2px 5px;">6</td><td style="border-right: 1px solid black; padding: 2px 5px;">7</td><td style="padding: 2px 5px;">8</td> </tr> </table> <p>X = missing      L = loose      B = bridge<br/>                 C = caps / crowns      D = damaged</p> | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | <p><b>ASA</b></p> <p>BP: _____</p> <p>HR: _____</p> <p>Temp: _____</p> <p>Weight: _____</p> <p>Height: _____</p> <p>BMI: _____</p> <p>Smoke: _____</p> <p>Alcohol: _____</p> <p><b>Apfel Score</b></p> |
| 8  | 7  | 6 | 5 | 4 | 3 | 2 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |
| 8  | 7  | 6 | 5 | 4 | 3 | 2 | 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |  |

|   |  |
|---|--|
| <p><b>Relevant Medication:</b></p> <p style="text-align: center;">Nil</p> | <p style="text-align: center; border: 2px solid black;"><b>ALLERGIES</b></p> <p style="text-align: center;">NKDA</p> |
|---|--|

|                       |   |  |   |  |   |
|-----------------------|---|--|---|--|---|
| <b>Investigations</b> | <input type="checkbox"/> Haematology FBC<br>Hb 14<br>WCC 16<br>Plt 203<br>Sickle: _____ | <input type="checkbox"/> Biochemistry U & E<br>K 5.1<br>Ur 7<br>Cr 103<br>Blood Sugar: _____ | <input type="checkbox"/> Coag. NAD<br><input type="checkbox"/> Gp. & Save<br><input type="checkbox"/> X - Match | <input type="checkbox"/> ECG NAD<br><input type="checkbox"/> X - Ray | Other:<br>Probable inflammatory mass in RIF |
|-----------------------|---|--|---|--|---|

**CONSENT:**  GA     Sedation     Epidural     Spinal     Regional     Suppository  
 PCA     EPCA     Other

Notes / Discussion / Technique proposed:

Consented for GA with LMA + RHS femoral nerve block

Risks explained and consented

Anaesthetic Information leaflet received by patient

**For attention of ward staff:** (further investigations, fasting, continue/omit current medication, etc.)





## DEBRIEFING

### POINTS FOR FURTHER DISCUSSION:

- Learn how to approach the management of unexpected hypertension under anaesthesia
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### DEBRIEFING RESOURCES

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<http://www.frca.co.uk/documents/hypertensioninanaesthesia.pdf>
2. Paix A, Runciman W, Horan B et al. Crisis management during anaesthesia: hypertension. Qual Saf Health Care. 2005. 14 (3):e12  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1744002/pdf/v014p00e12.pdf>
3. Abeysekera A, Bergman IJ, Kluger MT, Short TG. Drug error in anaesthetic practice: a review of 896 reports from the Australian Incident Monitoring Study database. Anaesthesia 2005. 60 p220-227  
<http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2044.2005.04123.x/pdf>
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## INFORMATION FOR PARTICIPANTS

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**PARTICIPANT REFLECTION:**

What have you learnt from this experience? (Please try to list 3 things)

How will your practice now change?

What other actions will you now take to meet any identified learning needs?

**PARTICIPANT FEEDBACK**

Date of training session:.....

Profession and grade:.....

What role(s) did you play in the scenario? (Please tick)

|  |                          |
|--|--------------------------|
| Primary/Initial Participant                            | <input type="checkbox"/> |
| Secondary Participant (e.g. 'Call for Help' responder) | <input type="checkbox"/> |
| Other health care professional (e.g. nurse/ODP)        | <input type="checkbox"/> |
| Other role (please specify):                           | <input type="checkbox"/> |
| Observer   | <input type="checkbox"/> |

|   | Strongly Agree | Agree | Neither agree nor disagree | Disagree | Strongly Disagree |
|---|----------------|-------|----------------------------|----------|-------------------|
| I found this scenario useful                      |                |       |                            |          |                   |
| I understand more about the scenario subject      |                |       |                            |          |                   |
| I have more confidence to deal with this scenario |                |       |                            |          |                   |
| The material covered was relevant to me           |                |       |                            |          |                   |

Please write down one thing you have learned today, and that you will use in your clinical practice.

How could this scenario be improved for future participants?  
 (This is especially important if you have ticked anything in the disagree/strongly disagree box)



**FACULTY DEBRIEF – TO BE COMPLETED BY FACULTY TEAM**

What went particularly well during this scenario?

What did not go well, or as well as planned?

Why didn't it go well?

How could the scenario be improved for future participants?