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Learning together, responding together: interprofessional learning enhancing emergency services collaboration

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Abstract

Purpose
This study evaluates the impact of multidisciplinary learning on the confidence, preparedness, and collaborative skills of healthcare and emergency service professionals during a field training exercise. It aimed to assess improvements in communication, teamwork, and decision-making skills, as well as identify areas for further training.

Design
Conducted at the Charmhaven Rural Fire Service (RFS) Control Centre in August 2024, the exercise involved NSW Ambulance, RFS, the Volunteer Rescue Association, and the Central Coast Local Health District, including doctors and nurses. High-fidelity simulations of emergencies, like mass-casualty incidents, cardiac arrests, and trauma cases, were conducted. Quantitative and qualitative data from pre-and post-exercise surveys measured learning outcomes and participant perceptions.

Findings
Quantitative data indicated that 100% of participants reported increased knowledge, understanding and collaborative ability across agencies, with confidence in interprofessional collaboration rising from 85.7% to 93.5%. All participants expressed greater appreciation for the operational challenges faced by other agencies. A slight decrease in self-reported preparedness for real-life scenarios (91.1% pre-exercise vs. 85.5% post-exercise) suggested participants recognised personal skill or knowledge gaps. Qualitative responses highlighted teamwork, communication, and cross-agency understanding as primary learning outcomes, though challenges in comprehending agency-specific protocols were also noted.

Research Implications
This study underscores the role of interprofessional learning (IPL) in bridging theoretical knowledge and practical skills for emergency response. Future research should integrate objective assessments of skill acquisition with improved evaluation engagement strategies.

Practical Implications
The results suggest IPL should be a regular practice to enhance collaboration and patient outcomes. Addressing training gaps, securing funding and improving engagement in evaluations are recommended.

Value
This study supports IPL as essential for enhancing patient outcomes and fostering cohesive emergency responses.

Limitations
The study's reliance on self-reported data may introduce bias, and the lack of objective skill assessment suggests further alignment in training content is needed.

Keywords: interprofessional learning, out-of-hospital, healthcare simulation, mass-casualty incident, emergency response, communication

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INTRODUCTION

Out-of-hospital healthcare is vital to emergency medical care, where timely and efficient collaboration among healthcare professionals can profoundly impact patient outcomes. The complexity and often high-risk nature of emergency medical care underscores the importance of effective interprofessional cooperation and collaboration (Patel & Hullick 2024b). Training typically involves multiple healthcare disciplines, and interprofessional learning (IPL) through simulation has emerged as a pivotal educational strategy (World Health Organization [WHO] 2010). Simulation-based training encompasses various modalities, including manikins, virtual reality, simulated patients and computer-based scenarios, which facilitate realistic immersive training experiences (Patel & Hullick 2024a). Various simulation applications have been explored, with scenarios ranging from basic life support to more complex procedures (Abelsson et al. 2014; Eisenmann et al. 2018).

Engagement of paramedic programs in interprofessional simulations has previously been discussed (McKenna et al. 2016; Rutherford-Hemming & Linder 2024). These studies suggest simulation not only improves technical proficiency but also enhances team dynamics and interprofessional reliance. IPL simulations have been shown to prepare participants for real-world emergencies and develop skills for high-pressure situations (Murray et al. 2019). Eisenmann and colleagues (2018) reported a model for longitudinal simulation training, integrating medical, nursing and paramedic students. Findings underscored the effectiveness of continuous, scenario-based training in promoting workplace practice changes, particularly enhanced communication and teamwork. Others have more broadly reviewed simulation in prehospital care, identifying essentials such as CPR, ventilation, and triage as focal points for simulation training (Abelsson et al. 2014).

Previous studies of IPL effectiveness in prehospital settings highlight the importance of simulation in bridging the gap between theoretical knowledge and practical application, fostering a collaborative environment that enhances patient outcomes (McCarthy, Patel & Spain 2020; McKenna et al. 2016). While existing research provides evidence supporting the efficacy of IPL through simulation, there remain several gaps to address. For example, there is a need for IPL tailored to an out-of-hospital care environment, including not only emergency department doctors and nurses but also members of rescue organisations. A comprehensive IPL approach should engage a diverse set of stakeholders, for example, paramedics, emergency physicians and nurses, volunteers from community rescue service, police and other key responders involved in prehospital care. These stakeholders play critical roles in managing emergencies, and their seamless coordination is essential for effective patient outcomes. Furthermore, while existing studies highlight the efficacy of simulation-based interprofessional education for isolated professional groups such as paramedics and medical staff (Eisenmann et al. 2018; McKenna et al. 2016), there is limited research on integrated training programs that address the needs of a broader spectrum of emergency response professionals (Abelsson et al. 2014). This is noteworthy because effective prehospital care relies on smooth coordination between diverse groups, including the unpaid volunteers and specialised rescue services who are often the first responders (Abelsson et al. 2014; Murray et al. 2019). Addressing and exploring this gap is critical for developing training programs that enhance teamwork across relevant disciplines, ensuring a unified response that could improve patient outcomes (Eisenmann et al. 2018; McKenna et al. 2016; Murray et al. 2019).

This study aimed to evaluate the impact of interprofessional training on participants' confidence and preparedness for real-life emergencies, plus the effectiveness of such learning in enhancing participants' self-reported skills and knowledge. A secondary outcome was the collation of information to inform future training exercises and key areas for improvement in interprofessional collaboration and communication.

METHODS

STUDY DESIGN

This study employed a pre-post interventional mixed-methods design to assess the impact of IPL on the confidence, preparedness and collaboration of participants. Both quantitative (Likert scale surveys) and qualitative (thematic analysis of free-text responses) data were collected, before and after a multi-agency simulation exercise, to evaluate changes in self-reported learning outcomes.

This study primarily aimed to assess changes in participant confidence and preparedness for inter-agency collaboration following the IPL training. These were measured using pre-and post-exercise Likert scale ratings, capturing shifts in self-reported readiness for a real-world emergency response.

Additionally, the study examined the impact of IPL on inter-agency understanding and teamwork, evaluating whether participants developed

a greater appreciation of other agencies' roles. This was assessed through both quantitative survey responses and qualitative thematic analysis of free-text reflections on teamwork and collaboration.

To further explore participant experiences, the study identified key benefits and challenges of IPL, focusing on communication, leadership and role clarity. Open-ended responses were thematically analysed to highlight common learning points and areas where participants faced difficulties.

Finally, participant feedback was used to inform future training improvements, capturing insights on potential refinements to IPL exercises. This included suggestions for enhancing simulation realism, addressing training gaps, and improving multi-agency coordination.

TRAINING EXERCISE AND STUDY SETTING

The training exercise was conducted on August 22, 2024 at the Charmhaven Rural Fire Service (RFS) Fire Control Centre, Central Coast, NSW. This site was selected to provide a realistic out-of-hospital environment for emergency responders, including NSW Ambulance, RFS, the Volunteer Rescue Association (VRA), and Central Coast Local Health District (CCLHD) medical and nursing teams. The setting facilitated inter-agency collaboration in high-fidelity emergency scenarios.

The exercise incorporated skills sessions (in the morning) and scenario-based simulations (in the afternoon), each carefully structured to promote IPL by encouraging participants to engage with professionals from different agencies in real-time problem-solving situations.

The morning sessions focused on interdisciplinary capability-building, with mixed-agency groups rotating through the following skill stations:

- NSW Ambulance – MARCHE Traumatic Cardiac Arrest Procedure: Allowed paramedics to demonstrate prehospital resuscitation techniques, such as needle thoracostomy, and explain the rationale behind pausing CPR in specific cases, while mixed-agency personnel observed and practiced coordination in high-risk scenarios.
- RFS – Virtual Reality Fire Exercise: Provided healthcare professionals insight into fire suppression tactics, reinforcing situational awareness for mixed-agency responders in fire incidents and enhancing their ability to anticipate prehospital challenges.
- VRA – The Road to Extrication: Showcased and refined extrication techniques for vehicle entrapments, ensuring mixed-agency responders gained insight into the logistical constraints of vehicle extrication. This highlighted the importance of collaboration in time-critical scenarios, allowing responders to prepare for immediate patient care post-rescue.
- CCLHD – Crew Resource Management (CRM) Exercise: Focused on leadership, teamwork, and clear communication, crucial for ensuring effective coordination in mass-casualty incidents.

The afternoon scenario-based simulations replicated high-pressure emergency situations requiring seamless inter-agency cooperation:

- Motor Vehicle Accident (NSW Ambulance-led): Paramedics, rescue teams, and hospital staff managed multiple casualties and emotionally heightened bystanders, necessitating clear communication for clinical concerns and scene management between prehospital teams and hospital teams. The scenario aimed to reinforce role clarity, as rescue teams focused on extrication, and healthcare providers on managing triage and initial stabilisation.
- Burning Building Rescue (RFS-led): Firefighters conducted rescues while paramedics triaged and stabilised victims with smoke inhalation and traumatic injuries. The scenario aimed to emphasise the importance of scene safety and cross-discipline emergency handovers.
- Machinery Trauma Incident (VRA-led): Teams worked together to extricate and treat patients with complex injuries, highlighting the need for synchronisation between extrication and medical intervention, particularly for complex industrial injuries.
- Mock Emergency Department (CCLHD-led): Hospital staff received and managed simulated patients, practicing structured and efficient prehospital-to-hospital handover techniques and inter-agency communication, for smooth patient transitions from the field to the hospital.

Each session was structured to break down professional silos, ensuring all participants gained firsthand experience of the roles, challenges, and decision-making processes of their counterparts. The integration of multiple agencies in the skill stations and scenarios reinforced the importance of clear communication, teamwork and coordinated emergency response strategies, aligning with the study's objectives of enhancing interprofessional preparedness. Further detail is given in the Supplementary Material. Attendees participated in the training exercise as themselves, consistent with their qualification, training or work experience.

SURVEY AND STUDY TOOLS

To evaluate the effectiveness of the exercise, data was collected through pre-and post-exercise surveys administered to all participants that aimed to measure changes in confidence levels, perceived preparedness, and overall satisfaction with the exercise. Questions were paired into like-themes for comparison pre-and post-training (for example, the perceived impact of the training exercise was measured by comparing responses to 'How do you think the interprofessional nature of the activity will impact your learning experience?' with 'How did the interprofessional nature of the activity impact your learning experience?'). The survey questions appear in the Supplementary Material, alongside further information about the structure and measurements.

DATA ANALYSIS

Responses to 3-and 5-point Likert scale questions are reported as counts and percentages for each response level. Descriptive and statistical analysis was conducted using RStudio V4.1 (R Core Team 2019). Statistical differences in categorical variables were evaluated using either a Pearson's

chi-squared (2x2 contingency tables) or a two-sided Fisher's exact (non 2x2 tables) test. Correlations were considered statistically significant when $p < 0.05$. Free-text responses to each question were analysed to determine themes in the data, which were categorised and frequency quantified via an inductive content analysis approach (Hsieh & Shannon 2005).

STATEMENT OF ETHICS

This study complied with the NSW Health Guideline *GL2007_020 – Human Research Ethics Committees – Quality Improvement & Ethical Review: A Practice Guide for NSW*, and was exempt from further ethical review.

RESULTS

Overall, 56 participants completed the survey pre-exercise and 62 post-exercise, out of a total 78 emergency responders (71.8% and 79.5% response rates, respectively). The distribution of responses according to participating agency appears in Table 1.

Table 1: Survey responses by participating agency

Participating Agency	Pre N = 56 (%)	Post N = 62 (%)
CCLHD - Medical	17 (30.4%)	13 (21.0%)
CCLHD - Nursing	8 (14.3%)	7 (11.3%)
NSW Ambulance	17 (30.4%)	21 (33.9%)
Other	3 (5.4%)	4 (6.5%)
RFS	9 (16.1%)	11 (17.7%)
VRA	2 (3.6%)	6 (9.7%)

Responses to the Likert scale questions are shown in Table 2. There was a statistically significant uplift in the perceived impact of such an interprofessional training exercise on participants' learning, with 100% of respondents reporting a positive or very positive impact on their learning, compared to 96.5% (n = 54) prior to the exercise ($p = 0.011$). There was a statistically significant change in appreciation felt for challenges faced by other agencies, with all respondents post-training reporting they better understood such challenges ($\chi^2 = 21.095$, df = 1, $p < 0.001$). Furthermore, all respondents after the intervention felt that IPL should be a regular part of training ($p = 0.2$). A notable increase was observed in the proportion of respondents feeling confident in their ability to collaborate with professionals from different agencies (Pre: n = 48, 85.7% versus Post: n = 58, 93.5%); however, this was not statistically significant. The only decrease was in self-reported preparedness for handling real-life scenarios, which dropped from 91.1% (n = 51) to 85.5% (n = 53). This change was also not statistically significant.

Table 2: Survey results prior to and after participation in the multi-agency training scenario

Characteristic	Pre N = 56 (%)	Post N = 62 (%)	*P*-value
Impact on learning			0.011
Neutral	2 (3.6%)	0 (0.0%)	
Positively	16 (28.6%)	7 (11.3%)	
Very positively	38 (67.9%)	55 (88.7%)	
Confidence in collaboration with professionals from different agencies			0.3
No	1 (1.8%)	0 (0.0%)	
Somewhat	7 (12.5%)	4 (6.5%)	
Yes	48 (85.7%)	58 (93.5%)	
Preparedness for handling real-life scenarios			0.3
Somewhat	5 (8.9%)	9 (14.5%)	
Yes	51 (91.1%)	53 (85.5%)	
Do you appreciate the challenges faced by other agencies?	38 (67.9%)	62 (100.0%)	<0.001
Should interprofessional learning be a regular part of prehospital care training?			0.2
Unsure	5 (8.9%)	0 (0.0%)	
Yes	51 (91.1%)	62 (100%)	

Participants were also asked questions for free-text answers, with identified themes appearing in Table 3. Common themes across all questions included impacts on respondents' understanding or appreciation of the role and practices of those in other agencies, understanding of specific skills related to the trauma scenario, collaboration and teamwork, communication and confidence levels. The top skill and knowledge gains reported were an understanding and appreciation of other agencies, collaboration and teamwork, plus increased understanding in specific skills (all approximately one-third of all respondents, Table 3). The next top-reported skill gained was communication, at 12.0% (n = 9).

Over a third of respondents reported the IPL experience would influence their understanding or appreciation of the work done by other agencies (n = 24, 32.0%), while nearly a fifth reported it resulted in increased confidence and/or reduced stress in such scenarios (n = 14, 18.7%). Others reported that it would influence their understanding of specific skills related to major trauma incidents (n = 9, 12.0%). Nearly a third of participants reported that collaboration and teamwork was their primary learning takeaway from the simulated scenario (n = 22, 29.3%), while others reported communication (n = 17, 22.7%), the understanding and appreciation of other agencies (n = 16, 21.3%), or their understanding of specific skills related to major trauma incidents (n = 13, 17.3%) as the major learning takeaway.

When considering the reverse aspect – challenges encountered – the largest factor reported was challenges with the practical aspects of a simulated environment (n = 12, 16.0%), followed by difficulties in understanding the specific protocols, equipment or processes from other agencies (n = 11, 14.7%, e.g., knowing what specific codes or acronyms meant). Some also reported difficulties with the specific skills required for a major trauma incident (n = 9, 12.0%).

Table 3: Themes identified in free-text responses. The number of responses in which a theme appeared per free-text question appears as the count, and as a proportion of all responses

Theme	What specific skills or knowledge did you gain from collaborating with professionals from other agencies?	What challenges did you encounter while working with professionals from different agencies	How do you think this interprofessional learning experience will influence your future professional practice?	What are your main takeaways from this activity that you can apply in your professional practice?
Understanding / appreciating the role / scope of practice of other agencies or people	22 (29.3%)	8 (10.7%)	24 (32.0%)	16 (21.3%)
Collaboration / teamwork	21 (28.0%)	3 (4.0%)	-	22 (29.3%)
Understanding of or specific skills of a major (trauma) incident	22 (29.3%)	9 (12.0%)	9 (12.0%)	13 (17.3%)
Communication	9 (12.0%)	4 (5.3%)	7 (9.3%)	17 (22.7%)
Understanding other agency's protocols/ equipment/ processes	-	11 (14.7%)	-	-
Confidence, reduced stress	3 (4.0%)	2 (2.7%)	14 (18.7%)	3 (4.0%)
Leadership / management / role of command	5 (6.7%)	6 (8.0%)	-	6 (8.0%)
Change in own thinking, reflective / better practice	5 (6.7%)	-	4 (5.3%)	-
Observational only, lack of interaction	-	2 (2.7%)	-	-

Theme	What specific skills or knowledge did you gain from collaborating with professionals from other agencies?	What challenges did you encounter while working with professionals from different agencies	How do you think this interprofessional learning experience will influence your future professional practice?	What are your main takeaways from this activity that you can apply in your professional practice?
Difficult understanding what is happening in a multi-agency response	-	4 (5.3%)	-	-
Resourcing	-	1 (1.3%)	-	2 (2.7%)
Practicalities of a simulated environment	-	12 (16.0%)	-	-
Preparedness	-	-	6 (8.0%)	3 (4.0%)
Decision-making	-	-	-	5 (6.7%)
Need/benefit of future training opportunities	-	-	3 (4.0%)	2 (2.7%)

DISCUSSION

The training, involving capability-building and simulation-based learning, was effective in enhancing interprofessional collaboration, communication, and participants' overall learning. The statistically significant improvement in some learning outcomes demonstrates the value of simulation-based IPL in preparing personnel for complex, real-world emergencies.

The statistically significant increase in perceived learning outcomes ($p < 0.05$, 100% positive or very positive impact post-exercise) is consistent with the literature, which supports the efficacy of simulation-based training (Langton et al. 2021; Yu et al. 2020). The increase in the percentage of participants reporting a 'very positive' impact on learning (from 67.9% to 88.7%, Table 2) underscores the value of immersive, hands-on training.

Although improvements in confidence for interprofessional collaboration were not statistically significant ($p = 0.3$), the upward trend (85.7% to 93.5%, Table 2) suggests there was potential meaningful benefit. This increase could still indicate a clinically relevant shift in perception, particularly given the relatively short duration of the intervention.

One possible explanation for the lack of statistical significance is the sample size, which may have limited the study's power to detect smaller but meaningful changes. Despite this, the consistent increase across groups supports the notion that IPL exercises positively influence confidence in multi-agency collaboration. Additionally, subgroup analysis showed that while paramedics and medical staff demonstrated a strong increase in confidence, some participants from non-healthcare backgrounds (e.g., RFS, VRA) exhibited more variable responses, possibly due to differing levels of prior exposure to medical simulations. The implications of this trend suggest that IPL may still provide real-world benefits by fostering greater familiarity and trust between different agencies.

Free-text feedback reinforced this; participants highlighted 'teamwork' and 'communication' as core takeaways (Table 3). This is consistent with existing research stressing the importance of communication in such real-world scenarios (Weile et al. 2021). Given this, future exercises should emphasise strategies such as closed-loop communication and leadership.

The change in self-reported preparedness for handling real-life emergencies (91.1% to 85.5%, $p = 0.3$, Table 2) was unexpected and warrants further exploration. While the training aimed to enhance collaboration, communication, and decision-making in high-pressure scenarios, it is possible that exposure to complex, multi-agency emergencies led participants to reassess their own readiness more critically.

One possible interpretation is that some participants may have overestimated their preparedness before the training, due to limited prior exposure to interprofessional emergency scenarios. The immersive nature of the simulation may have challenged initial assumptions, prompting participants to recognise areas requiring further development — a phenomenon observed in prior studies on self-assessment in medical education (Elendu et al. 2024; Wenk et al. 2009; Zheng, He & Lei 2024).

Alternatively, the decrease may indicate that the training highlighted specific gaps in emergency management skills that were not fully addressed within the session. While the training incorporated a broad range of scenarios (mass casualty, cardiac arrest, trauma extrication, fire rescue),

its primary focus was collaborative teamwork rather than individual clinical proficiency. Future iterations of IPL exercises could integrate targeted skill-building components to reinforce technical competencies alongside inter-agency coordination.

Although this decrease was not statistically significant, it underscores the importance of ongoing training and evaluation to ensure participants feel both competent and confident in real-world emergency responses.

A significant finding was the increase in appreciation of challenges faced by other agencies, with 100% of participants reporting an improved understanding post-exercise compared to just 67.9% beforehand ($p < 0.001$, Table 2). The scenarios (Supplementary Material 1) were instrumental in fostering understanding, suggesting they were effective in promoting respect for the roles and responsibilities of others. By experiencing others' challenges, participants were able to deepen their appreciation for the complexities of interdisciplinary collaboration.

Participants supported IPL being a regular activity (100% post-exercise, $p = 0.2$ Table 2), reflecting a growing recognition that regular IPL is important for maintaining and improving collaboration and preparedness. This aligns with broader trends in healthcare education, where IPL is increasingly seen as critical for building and sustaining effective team dynamics (Hood, Cross & Cant 2022; Kiessling et al. 2022). Future exercises should be planned regularly to ensure these skills are reinforced.

The survey captured diverse perspectives from paramedics, medical staff, firefighters, and rescue volunteers (Table 1). These varied perspectives strengthened the study's findings, demonstrating that IPL extends beyond skill acquisition to fostering mutual understanding between agencies. While rescue teams primarily focused on operational execution, medical staff emphasised the importance of interdisciplinary communication and coordination. This highlights the value of IPL in breaking down professional silos and improving real-world emergency responses. Future training could further tailor sessions to address the specific needs of each group, such as providing more hands-on medical training for rescue personnel and enhancing leadership role-play exercises for healthcare teams.

Analysis of the free-text responses often featured themes such as 'teamwork', 'communication', 'understanding' and 'different roles' (Table 3). The prominence of the word 'different' reinforces the indication that participants came away with a deeper understanding of the challenges of other agencies, aligning with the aforementioned quantitative data. CRM skills were widely valued across all groups, emphasising the importance of leadership and structured communication in high-pressure situations. The frequency of the themes of 'teamwork' and 'communication' underscores the importance of these skills (Table 3). The simulation provided participants with opportunities to practice these skills, allowing them to refine their approaches. This aligns with existing work suggesting that effective communication and teamwork are critical (Herzberg et al. 2019; Kilner & Sheppard 2010).

There are several limitations to this study. Firstly, the evaluation relied on self-reported data, potentially introducing bias and limiting objectivity. Future exercises could include objective measures such as performance evaluations, providing a more comprehensive assessment. Due to survey

anonymisation, it was not possible for direct comparison of individual participant responses. Finally, the sample size was limited, and data was only completed by approximately 50% of all exercise participants, which may limit finding generalisability.

CONCLUSIONS

The IPL exercise was successful in achieving its objectives of enhancing interprofessional collaboration and preparedness. Improvements in learning outcomes and inter-agency appreciation underscore the value of simulation-based IPL in preparing healthcare and emergency service professionals for complex, real-world emergencies. Additionally, the strong support for regular IPL highlights the importance of incorporating such training into professional development programs, ensuring interprofessional collaboration continues to improve. By addressing these areas, future exercises can further strengthen emergency response capabilities, enhance teamwork, and ultimately improve patient outcomes in critical situations.

Conflict of Interest

The authors declare that there are no conflicts of interest.

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SUPPLEMENTARY MATERIAL

This supplementary material was part of the submitted manuscript and is presented as supplied by the authors.

SUPPLEMENTARY MATERIAL 1 – TRAINING EXERCISES

Morning Skills Sessions

The morning session included four skills stations, each facilitated by a specific agency or organisation. Participants were divided into multidisciplinary groups and rotated through the following skills stations:

NSW Ambulance – MARCHE Traumatic Cardiac Arrest Procedure:

This session focused on the MARCHE (Massive hemorrhage, Airway, Respiration, Circulation, Hypothermia, and Everything else) algorithm for managing traumatic cardiac arrests. The session provided an opportunity for non-NSWA participants to understand the procedures NSW Ambulance Paramedics use and allowed Paramedic participants to practice applying the MARCHE algorithm, including the new Needle Thoracostomy skill. Participants from other organisations such as RFS and VRA gained valuable knowledge surrounding the management of traumatic cardiac arrests. Understanding why chest compressions are sometimes paused to perform other interventions is particularly important for RFS and VRA members who may be on scene providing care prior to ambulance resources.

NSW Rural Fire Service (RFS) – Virtual Reality Fire Exercise:

This station utilised virtual reality technology to simulate a fire scenario, allowing participants to experience firefighting techniques and strategies in a controlled environment. The focus was on fire suppression tactics, risk assessment, and crew coordination.

Volunteer Rescue Association (VRA) – "The Road to Extrication":

This session covered the basics of vehicle extrication, including scene size-up, hazard identification, and creating an effective pathway for extrication. Participants practiced using rescue tools and techniques to safely extricate victims from a crashed vehicle. Understanding how and why rescue operators carry out their role in the manner they do as well as gaining an understanding of the technical terms involved is helpful for paramedics in particular and promotes greater inter team unity.

Central Coast Local Health District (CCLHD) Team – Crew Resource Management (CRM) Exercise:

This station focused on crew resource management skills, emphasising effective communication, teamwork, and leadership in emergency scenarios. Participants engaged in exercises designed to improve their ability to manage resources and personnel during a crisis.

Afternoon Scenario-Based Simulations

The afternoon session comprised three medium-sized simulations, each facilitated by a different organisation, followed by a mock hospital emergency department scenario run by the CCLHD team.

NSW Ambulance Scenario – Motor Vehicle Accident (MVA) Involving Car and Cyclists:

This scenario simulated a high-speed collision between a car and a group of cyclists. Participants responded to multiple casualties, including a cyclist with a STEMI (ST-Elevation Myocardial Infarction), a cyclist with a traumatic cardiac arrest, and a car passenger with potential labour complications. The scenario required rapid triage, application of the MARCHE algorithm, and coordination with other agencies for extrication and medical intervention.

NSW Rural Fire Service (RFS) Scenario - Burning Building:

Participants responded to a structure fire in a single-storey metal facility. The scenario involved firefighting operations, search and rescue of unconscious victims inside the building, and medical intervention for a firefighter suffering a potential cardiac arrest. The focus was on offensive firefighting tactics, rescue operations using Compressed Air Breathing Apparatus (CABA), and integrating medical response with fire suppression activities.

Volunteer Rescue Association (VRA) Scenario - "Man vs Machine":

This scenario simulated a machinery incident involving three victims, including one trapped in a wood chipper, another with an eye injury, and a third with an impalement injury. The exercise required participants to perform a 360-degree size-up, isolate the machinery, and conduct a coordinated rescue with paramedic support. The focus was on rescue operations, medical first aid, and integrating with paramedic teams to manage complex trauma cases.

CCLHD Team Scenario - Mock Emergency Department (ED):

A mock ED was set up on-site to simulate the hospital environment where participants managed incoming patients from the earlier scenarios. The ED included resuscitation beds and a waiting room filled with live actor patients presenting various medical conditions. This scenario aimed to test the hospital staff's ability, to manage multiple casualties, prioritise care, and perform emergency medical procedures in a controlled, high-pressure environment.

SUPPLEMENTARY MATERIAL 2 – SURVEYS AND STUDY TOOLS

A structured survey tool was used to measure participant experiences, learning outcomes, and collaboration effectiveness. The tool included:

Pre-exercise survey: Captured baseline perceptions, confidence, and expected learning outcomes.

Post-exercise survey: Assessed changes in knowledge, confidence, and appreciation of inter-agency collaboration.

Question formats: Likert-scale ratings (3-and 5-point), categorical responses, and open-ended questions for thematic analysis.

Key focus areas: Communication, teamwork, role understanding, and preparedness for real-world scenarios (full survey in Supplementary Material 2).

Responses were free text unless otherwise indicated

Prior to training exercise

What agency or organisation do you work for?

What are your expectations for this interprofessional Learning activity?

How do you think the interprofessional nature of the activity will impact your learning experience? (Very Positively, Positively, Neutral, Negatively or Very Negatively)

What specific skills or knowledge are you hoping to gain from collaborating with professionals from other agencies?

Do you feel prepared to engage in communication and collaboration with professionals from different agencies? (Yes, No or Somewhat)

What challenges do you anticipate while working with professionals from different agencies?

Do you feel that participating in this activity will better prepare you to handle real-life prehospital situations? (Yes, No or Somewhat)

How do you think this interprofessional learning experience will influence your future professional practice?

Do you currently have a good understanding of the roles and challenges faced by other agencies in prehospital care? (Yes, No or Somewhat)

Do you believe that interprofessional learning activities should be a regular part of prehospital care training? (Yes, No or Unsure)

What are your main objectives for this activity, and how do you plan to apply the learning outcomes in your professional practice?

After training exercise

What agency or organisation do you work for?

How did the interprofessional nature of the activity impact your learning experience?

What specific skills or knowledge did you gain from collaborating with professionals from other agencies?

Do you feel that the learning objectives were met? (Yes, No, or Partially)

Has today's exercise increased your ability or confidence in communication and collaboration among different agencies? (Yes, No or Somewhat)

What challenges did you encounter while working with professionals from different agencies

Do you feel more prepared to handle real-life prehospital situations as a result of this interprofessional learning activity? (Yes, No or Somewhat)

How do you think this interprofessional learning experience will influence your future professional practice?

Did this activity provide you with a better appreciation of the challenges faced by other agencies in prehospital care? (Yes, No or Somewhat)

Do you think interprofessional learning activities should be more frequent in prehospital care training? (Yes, No or Unsure)

What are your main takeaways from this activity that you can apply in your professional practice?

How could this activity be improved?

Did you feel that the learning objectives were met? (Yes, No or Partially)

Would you recommend this education continue to be provided?