Use of high-fidelity in-situ simulation to evaluate the operational readiness of Ireland's National Isolation Unit for High Consequence Infectious Diseases

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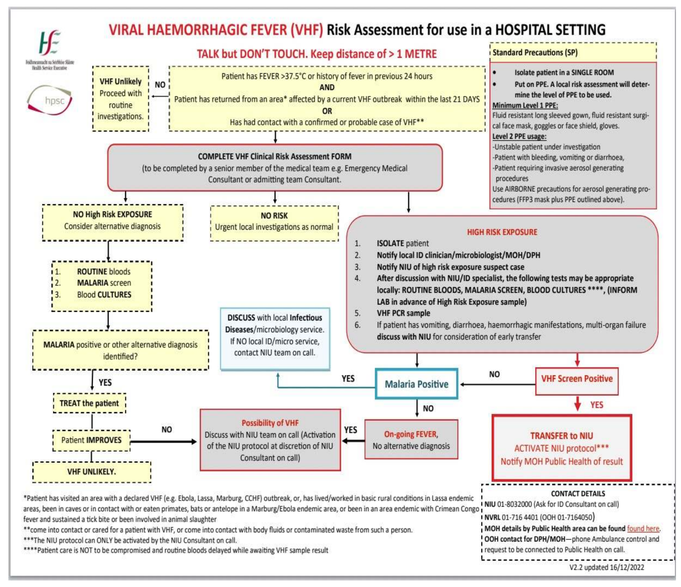
Introduction

- The Mater Misericordiae University Hospital (MMUH) hosts Ireland's National Isolation for High Consequence Infectious Diseases (HCIDs). Operational since 2008, it is currently undergoing development into a state-of-the-art high-level isolation unit (HLIU) as part of the national strategy for emerging health threats preparedness.
- The 2022 Health Protection Surveillance Centre (HPSC) guidelines on the management of Viral Haemorrhagic Fevers [1] and National Isolation Unit's (NIU) activation protocol provide a standardised end-to end-clinical pathway which serves as a template for the management of HCIDs in Ireland.
- HLIUs face distinct operational challenges related to the large multidisciplinary teams involved, extensive training required, and infrequent nature of HCID events [2]. In-situ simulation is an established tool for evaluating preparedness in the management of HCIDs [3,4]. It also has an educational role for staff.

Aim

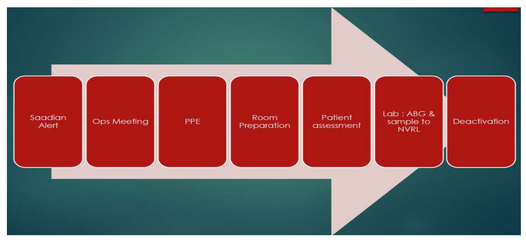
- ***Local Simulation:*** To test the operational readiness of NIU staff and facility. 2 high-fidelity in-house simulations of NIU activation took place on **19th September 2023** and **15th February 2024**.
- ***Inter-agency Simulation:*** To test interoperability of HCID patient transfers with national/international authorities and transfer agencies. 1 national transfer simulation and 1 international transfer simulation took place on **27th March 2024** and **10th April 2024** respectively .
- All simulations were followed by a feedback and debrief session with participants, observers and relevant stakeholders.

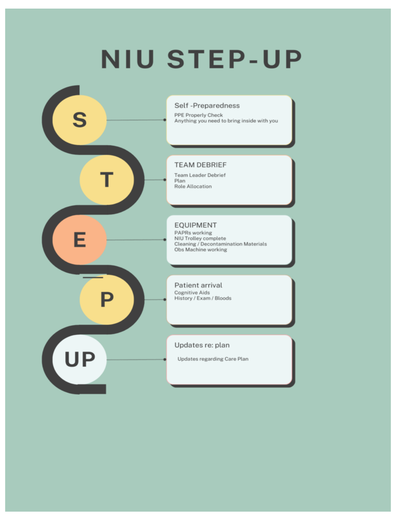


Local Simulation: Internal NIU Activation

- Organised by the MMUH NIU Operations Sub-Committee. Simulation of NIU activation for a suspected HCID patient in the community.
- ***Key processes:*** Initial notification, Saadian alert system, Intra-Operations activation meeting, Personal Protective Equipment (PPE) and room preparation, Patient arrival/assessment, Specimen collection and transfer to the National Virus Reference Laboratory, Deactivation process.
- ***Key learning for the NIU:***

- Improved internal communication systems: Saadian alert list, Siilo confidential text messaging group.
- Updated standard Intra-ops activation meeting agenda
- Developed IPC-compliant protocol for collection and packaging of Category A biological specimens.
- Developed pre- patient arrival clinical team checklist: 'STEP-UP'.
- Development of PPE training programs (in-person and online) for clinical staff.
- Patient room modifications: White-board for writing, need for back-up communication tools.
- Improved patient experience: Disposable staff name tags on PPE.





Inter-agency Simulation: *Tripartite Exercise Volare* (International HLIU transfer)

- Organised in collaboration with a wide range of national and international health, security and transport agencies within Europe. Simulation of the expatriation of a HCID patient from the NIU to a HLIU in Germany through the Norwegian Jet Ambulance for HCIDs 'RescEU-NOJAHIP'.
- ***Key processes:*** Internal, inter-agency and international communication systems and protocols to facilitate the international transfer of a HCID patient. NAS-NOJAHIP collaboration to transfer patient from the NIU abroad. NOJAHIP PPE/transfer processes and clinical handover in the NIU to facilitate safe transfer.
- ***Key learning for the NIU:***

- Need for clear communication platforms, agenda, and timings for international meetings.
- Updated protocol to include provision of patient passport details to Public Health for international transfer.
- Patient preparation for transport: IV access, urinary catheter. Clinical handover with NOJAHIP crew prior to patient room entry.
- Simulation Learning: Livestreaming and display of virtual meetings in viewing rooms for observers in large simulations.
- Improved patient experience: Need for clear patient consent for international transfer. Consideration for virtual communication with family /pastoral support.

Inter-agency Simulation: *Exercise Aistriu* (Inter-hospital transfer)

- Organised in collaboration with the HSE National Emergency Management Office (NEMO), HPSC, National Ambulance Service (NAS), and Our Lady of Lourdes Hospital, Drogheda. Simulation of the transfer of a HCID patient from a referring hospital in Ireland to the NIU.
- ***Key processes:*** Internal, inter-hospital, and inter-agency communication processes including with the National Emergency Operations Centre (NEOC) , Trans-Operations Group(TOG), NAS, An Garda Síochána. Patient isolation and specimen collection at the referring hospital. Real-time staffing capabilities for the NIU. Patient transfer through NAS and admission to the NIU.
- ***Key learning for the NIU:***

- Closing the communication loop: follow-up for meeting action points.
- Development and dissemination of safe standard protocols for specimen collection and appropriate PPE use at referring hospitals.
- Nominated contact point for external agencies during patient transfer and arrival: MMUH Operations Manager.
- Development of Nursing and Ward Decant meetings and template.
- Improved patient experience: Multi-language patient information leaflets on the transfer process.

Limitations, Conclusions, Next Steps

- The new NIU will have a different layout, PPE and decontamination process and so will require new training and simulation.
- There remains uncertainty around capacity to staff the NIU with suitably-trained doctors, and around PPE procedures for NAS with the NIU.
- In conclusion, simulation is an important evaluative and educational tool for HCID preparedness. This process provided invaluable feedback and informed changes to the NIU protocol.
- *Next Steps:* Interdisciplinary simulations with the Emergency Department, Anaesthetics, and Obstetrics. Procedural skills training in high-level PPE.

References & Acknowledgements

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