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EUMIC Study (QUIT EMR trial) Transporting the critically ill patient: Quality and Outcome

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Quality and efficacy of interclinical critical care transport in the Euregion Meuse-Rhine: An international, prospective, observational, multicentre study (QUIT EMR trial)

Nederlandse Trial Register: NTR4937

The QUIT EMR trial is part of the crossborder project Euregional Mobile Intensive Care (EUMIC), which aims to improve quality and efficacy of interclinical transportation of critically ill patients in the Euregion Meuse Rhine.

Within the study region (Region MICU Maastricht, City and District of Aachen, District of Heinsberg and District of Düren) approximately 5.000 interclinical transports of critically ill patients per year are performed. The patient population is highly heterogeneous concerning severity of illness; furthermore, these transports are performed with an extended variety of transporting systems. Because validated quality measurement tools and triage criteria in terms of transport are lacking, we cannot determine which transport system can be considered as safe for which patient or which patient benefits from being transported with highly advanced transport facilities.

Therefore the study group worked out two monitoring scores:

a) direct Transport outcome measured by a developed transport score (QUIT EMR)

b) short term mortality and morbidity measured by a developed Simplified EMR Outcome Score (SEMROS)

For the **QUIT EMR score** 100 transport charts of the MICU Maastricht have been analysed, the QUIT EMR score has been calculated by the coordinating investigator in all cases. Then 4 experts (all anesthesiologists experienced in interclinical transport from Maastricht University Medical Center+, MUMC+) revised the transport charts. None of them knew the QUIT EMR score in detail. In 87,7% of the cases the expert and the QUIT EMR score came to the same conclusion.

Concerning the **Simplified EMR Outcome Score (SEMROS)** 90 cases of patients transported by the MICU Maastricht towards the ICU department of the MUMC+ have been analysed and then SOFA scores pre and post transport have been calculated. In 90% of the cases SOFA outcome and SEMROS outcome were identical.

Study Objectives

The **primary objective** of the study is to validate the QUIT EMR score in a prospective multicentre study by comparing three defined levels of transport systems.

Hypothesis: Transports with high standard ground transport systems compared with medium and/or low standard ground transport systems will show for the whole population at least trends and for subgroups significant differences in the developed QUIT EMR score and/or in number/ severity of adverse events and /or in number of interventions.

Whereas **secondary objectives** are:

- To analyse if negative transport outcome (measured by QUIT EMR score) influences 24 hour post transport morbidity or mortality (measured by SEMROS).

Hypothesis: Negative transport outcome leads to a higher 24 hours post transport morbidity.

- To detect patients' characteristics that define the patients' needs in terms of level of transportation facility.

Hypothesis: Pre transport data that indicate a benefit of transport with a high standard transport system can be detected and defined.

- To detect predictive outcome parameters concerning 24 hours post transport mortality.

Hypothesis: Pre transport data that indicate 24 hour post transport mortality will be detected and defined.

Data collection

Data of all adult transports with indication for direct supervision by a physician within the study region will be documented in a web-based database by the transport team. Furthermore the clinical condition of the patient 24 hours after transport will be obtained by contacting the receiving ICU.

Ethical considerations

Only anonymous and routine patient data will be used for analysis. No interventions will be performed. Therefore the MREC's of the university hospitals Maastricht (NL) and Aachen (D) waived away the need for informed consent.

Appendix

	Minimum requirements ambulance/equipment	Minimum requirements team member 1	Minimum requirements team member 2
System A (high)	MICU/ITW[1]	Intensivist[2]	ICU nurse/ IC Paramedic[3]
System B (medium)	IC ambulance[4]	ICU Physician[5]	Paramedic
System C (low)	Standard Ambulance	Physician	Paramedic

Table 1: definitions of different levels of ground transport systems

1) *High volume ambulance with boarding ramp, standard ambulance equipment and ICU equipment including ICU ventilator, minimum of 6 infusion pumps, invasive monitoring, ability to reach the patient from all sides, ability to transport patients with additional medical devices as ECMO, NO, IABP, back up systems for ventilator/ monitoring/defibrillation unit suction unit, minimum of 6.000 l Oxygen, if the ventilator is dependent on pressured air also 6.000 l of pressured air in the ambulance, stand alone capacity 120 min,*
2) *board certified Intensivist*
3) *Paramedic with Intensive Care qualification in addition*
4) *Standard ambulance with standard ambulance equipment and IC transport ventilator, minimum of 4 infusion pumps, invasive monitoring, 2.000 l of oxygen in the ambulance, stand alone capacity of 60 min*
5) *FCCS or FCCS like trained physician with at least 6 months Intensive Care experience*

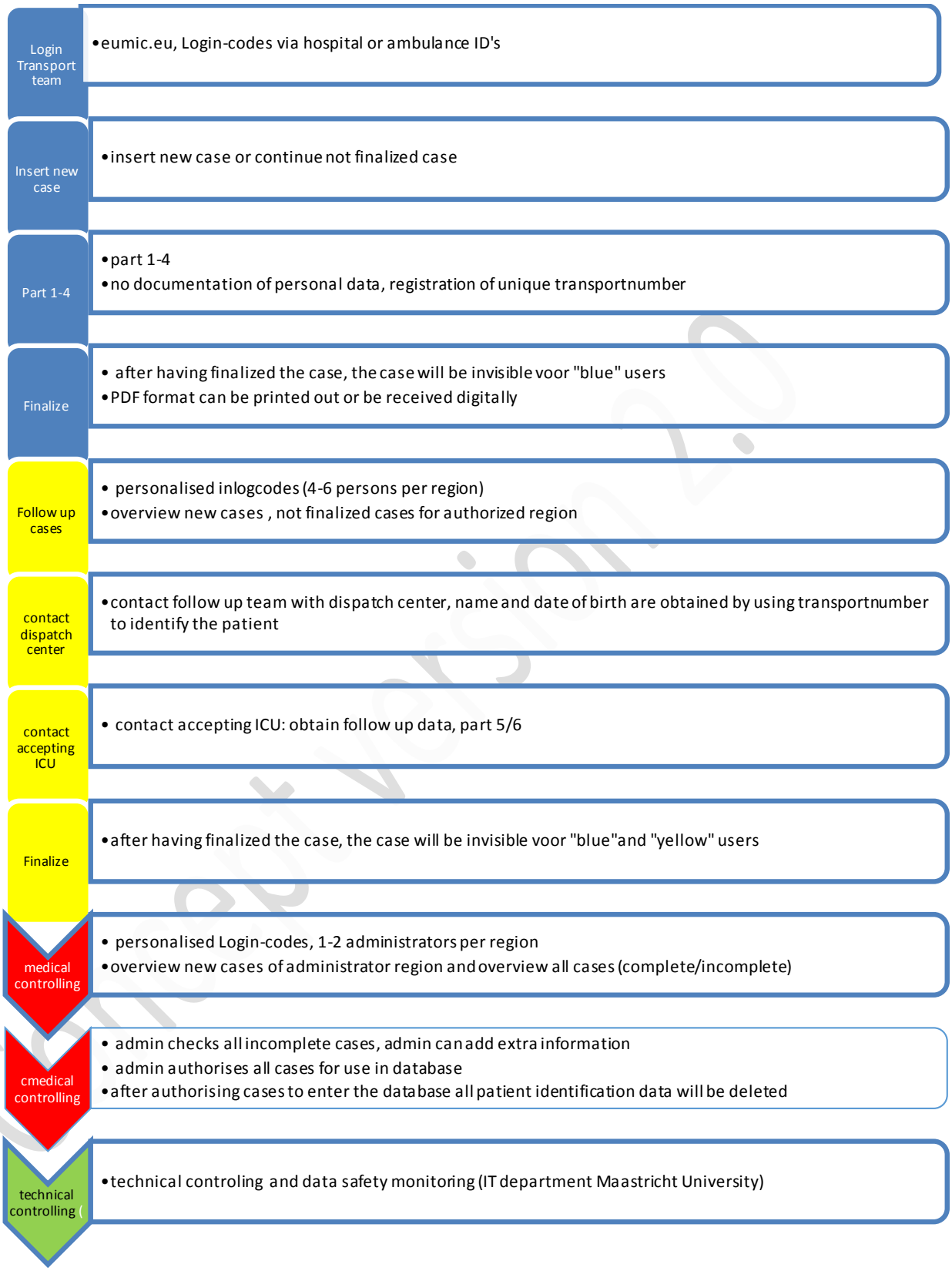

Figure 1: Work flow data registration