



ECNS AND LOWCODE

ECNS PROGRAM

The Emergency Communication Nurse System (ECNS) is certified by the International Academies of Emergency Dispatch® (IAED™) as its Fourth Pillar of Care and is available to agencies with an ACE designation in the use of the IAED's Medical Priority Dispatch System™ to triage 911 calls.

The ECNS program has been (and still is) the pioneering program used to triage low acuity 911 calls in the international EMS market, since 2001. The then East Anglia ambulance service was the first adopter of this technology in the UK and has been using the technology uninterrupted for the last 19 years growing from a couple of LowCode workstations to where East of England Ambulance Service Trust currently are running 40 concurrent LowCode workstations during the COVID-19 pandemic. The ECNS system was first adopted by Richmond ambulance service in Virginia in 2004 followed by Medstar in Fort Worth Texas a few years later and a few more US based agencies followed subsequently including a flagship implementation at REMSA in Reno Nevada. ECNS was deployed country-wide in Austria (in German) in 2017 as well as in Wales in 2022.

ECNS is now used on four continents around the world (in 7 languages) to triage low acuity calls from the public in both the 911 sector and general telephonic triage sector.

Quality assurance and quality improvement is of utmost importance and therefore standards are set to ensure the safe and effective use of the tool.

Unlike competing products, it is a requirement for an agency to have the ACE designation in MPDS in order to utilize ECNS (should your agency not have an ACE designation currently, we will work closely with your agency to achieve this goal over the next few months). This ensures that only truly low acuity calls are sent for secondary triage and no undue delay is caused in responding to potentially more urgent cases.

The ECNS program has a very strong link to the current MPDS (primary triage product) used by your agency.

- The International Academy of Emergency Dispatch (IAED) is the clinical governance arm for both programs.
- The LowCode clinical decision software system has a proprietary link with MPDS on a code level enabling only a preselected set of codes to be triaged via ECNS, therefore preventing codes of a higher acuity accidentally be sent for secondary medical triage.
- Both triage programs are managed within the same building allowing for cross pollination between the programs on a clinical and technological level.
- Both programs use the AQUA clinical audit system to ensure standards are achieved and maintained.



PrioritySolutions™

LOWCODE APPLICATION SOFTWARE

The LowCode application software has been enhanced over the last 2 decades of experience in the niche 911 secondary triage environment and a few features are highlighted below:

DECLARE AN EMERGENCY FEATURE

A “Declare an Emergency” feature allows the registered nurse (ECN) to arrange an emergency response to be dispatched (via the proprietary LowCode CAD interface) at any time during the call flow by pressing a single button should a patient's condition suddenly deteriorate during the assessment.

NOTED ANSWER OPTION

The answer logic includes a “Noted” answer option that allows the registered nurses to use their clinical judgment when an answer to a question is received out of context, allowing the clinician to ask clarifying questions and document in a note feature the rationale for continuing the triage questioning process.

MULTIPLE POTENTIAL DISPOSITIONS

Recommended Care Level dispositions include Emergency Response needed but not an ambulance transport, seeing a clinician within 4 hours, the same day, several days out, routine appointment, and self-care instructions, among others.

CUSTOMER-MODIFIABLE SCRIPTS

In addition to the scripted “Protocol Assessment Questions” there are various customer modifiable scripts (Call intake, Pre-Triage, Case Exit and Follow Up scripts), allowing the agency to acquire information that the agency deems desirable or relevant.

CUSTOMER-MODIFIABLE POINTS OF CARE AND DIRECTORY OF SERVICES

The agency will determine which types of community resources will be used (for example to refer a patient to be seen at the clinic for an appointment today, in a couple of days, remote video assessments, or to give the patient homecare advice with worsening instructions or refer them to a pharmacy).

The agency will have the ability to self-maintain the list of the specific resources which will be selected for each individual caller.

Community resources may include health care entities such as Emergency departments, Urgent care centers, selfcare advice, dentists and Community Paramedics, Poison control, etc.

INTEGRATES WITH ALTERNATIVE TRANSPORTATION AND DESTINATION INITIATIVES

The ECN will use the determined Recommended Care Level, Point of Care in the community, and patient preference and needs in determining the most appropriate transportation to the health care destination.

ADJUNCTIVE VIDEO CONFERENCING FACILITY INTEGRATED INTO THE LOWCODE PLATFORM

The most recent release of LowCode contains an integrated Video/ Chat feature assisting the clinician when they feel it is important to lay eyes on the patient, it might be to get a general impression of the patient or to look at a laceration/ rash or other clinical sign to potentially enhance the telephonic triage process.



CASE MANAGEMENT

LowCode software includes a Log of the information gathered (includes questions asked and answers) for medical record purposes. Each individual call that comes into the center is captured for a given patient under the same medical record.

LowCode also has the ability to document Care Plans for selected patients/frequent callers which can be referenced during each call. The ability to set up call-back patient status checks and reminders is built into the software

THE LOWCODE USER INTERFACE

The LowCode UI is WCAG 2.0 Level A compliant

LOWCODE CONSULTATION DATABASE

A new LowCode Consultation database facilitates datamining for our clients and a template ECNS Master Analysis report (PowerBI) is available to monitor internal results as well as benchmark against other ECNS users.

NOTE SHARING CAPABILITY VIA THE NEW LOWCODE.CLOUD

This feature gives the clinician the capability to send a secure message via email or SMS text to:

- Provide evidence of the outcome of the triage which the patient can use to interact with their physician
- Provide a convenient reminder for interim self-care instructions and/or Point of care suggested by the clinician.
- Attach URLs to information resources the patient/caller can access
- Provide a comprehensive Call log or call summary to the patient's primary care provider



ECNS PROTOCOL SET AND CLINICAL GOVERNANCE PROCESS

The base set of protocols has been used to process over 90,000,000 calls worldwide, including calls entering from an emergency communication center environment.

The ECNS triage system includes a series of symptom-based, gender and age-specific, quaternary protocols which are used by call center clinical advisors (CAs) interpret the symptoms of callers, and to direct these callers to an appropriate level of care or self-management. Each clinical telephone triage protocol features a logically structured question sequence that enables the clinical advisor to assess the possibility that serious, emergent or life-threatening pathology may underlie the caller's symptoms. Each protocol consists of an array of flow-control and logic pointers linked to clinical content containing triage questions and end point instructions. The questions are dynamically personalized to the caller's demographics (the question will address the patient's name in case a second party caller answers the questions) real-time to foster effective dialogue between caller and clinical advisor.

Clinical telephone triage protocol content is further enhanced through linkage to protocol-specific overviews, clinical rationales for each question in the sequence, and a reference list. There are currently in excess of 200 symptom based clinical triage protocols in the ECNS set. Although algorithmic in design, this protocol-based approach has been adopted inclusive of several areas where clinical advisor clinical judgement is incorporated into the triage process. These areas include:

1. At any point in the call: A registered nurse can Declare an Emergency at any time.
2. Protocol Selection: To select the appropriate protocol based on the patient's most serious symptoms.
3. Protocol Assessment: To ask questions and apply the answers in the context of a given patient condition.
4. Recommended Care Level: To override the system recommended RCL.
5. Point of Care: To determine where in their community they should go and how they should get there.
6. Instructions: To select the most appropriate interim self-care Instructions.

The protocols have been updated and enhanced regularly over the past 22 years as new evidence became evident. During the past decade, numerous recommendations made by the National Institute for Health and Care Excellence (NICE) has been considered in the update process. Australian, United States and international best practice and evidence-based recommendations have regularly been incorporated in the review, updates of the protocols over the last decade.

"THE CLINICAL GOVERNANCE OF THE ECNS PROTOCOL IS A FUNCTION OF THE IAED"

Quaternary logic driven protocols are used by registered nurses in non-emergent situations to interpret the symptoms of callers, and to direct these callers to an appropriate level of care or self-management. Each clinical triage protocol features a logically structured question sequence that enables the clinical advisor to assess the possibility that serious, emergent or life-threatening pathology may underlie the caller's symptoms. The quaternary answer logic includes a "Noted" answer option that allow the clinician to use their clinical judgment when an answer to a question is received out of context, allowing the clinician to ask clarifying questions and document in a note feature the rational for continuing the triage questioning process.

There are gender specific protocols for those topics that require them. Female related protocols address Pregnancy, Genital symptoms, Menstruation related symptoms, and Breast related symptoms. Male related protocols address Genital symptoms, Sexual Function, Penile Problems, and Scrotal or Testicular Problems

The protocols are designed to minimize inter-user variability. For example, each protocol features a structured set of questions, such that a caller's response to a particular question automatically triggers the selection of an appropriate follow-up question. The system is configured to prevent RNs from skipping questions, changing the order of questions, starting in the middle of a protocol or otherwise introducing bias (unintended variation)



THE AGE SPECIFIC CLINICAL TRIAGE PROTOCOLS ARE BROKEN DOWN INTO 6 AGE GROUPS:

Geriatric (65+)	Toddler (1-4yrs)
Adult (16-end of life)	Infant (0-1yr)
Child (5-16yrs)	Newborn (<3 months)

into the triage process. In addition, each protocol question is structured to evoke a simple yes or no response. This minimizes the risk that call handlers may misinterpret the information provided by callers.

“PROTOCOLS ARE CONFIGURED TO PREVENT A CALL TAKER FROM SKIPPING QUESTIONS OR OTHERWISE MODIFYING THE TRIAGE PROCESS IN A WAY THAT MIGHT ALLOW PATIENTS WITH HIGH RISK/DANGEROUS SYMPTOMATOLOGY TO ESCAPE IMMEDIATE DETECTION”

The protocols used in this set (IAED) provide an excellent “safety net” for callers. The safety net derives from the content and design inherent to each protocol. In particular, they are organized to identify first any life-threatening conditions that may be present. These include but are not limited to: Respiratory distress; Shock (Hypovolemic, Septic); Aortic Aneurysms; Meningeal irritation; Hemorrhagic-type Headache, Acute myocardial Infarct; Symptoms of Stroke etc.

These protocols are designed such that high risk and dangerous or potentially life-threatening conditions are identified early within the question sequence.

Each protocol in LowCode features a structured set of questions, which are organized such that callers who require emergency treatment or urgent care are identified as quickly as possible. Unlike triage systems that are built around open-ended, protocol-based content, the protocols are configured to prevent a call taker from skipping questions or otherwise modifying the triage process in a way that might allow patients with high risk/dangerous symptomatology to escape immediate detection.

More commonly, the protocols prompt RNs to gain additional information about successively less severe conditions that may be causing the caller's symptoms.

This process eventually enables the RNs to determine an appropriate disposition for the situation at hand. Along with a Recommended Care Level disposition and Point of Care (a locally defined disposition tier differentiating this system from competitors) they provide specific interim management, self-care, and call back instructions as appropriate.

Although a protocol may have 50 or 60 questions only a few will be explored because of age and gender logic which is incorporated into the questions excluding those questions in the protocol that is age or gender inappropriate. Furthermore, the branching logic ensure the minimum, relevant questions be explored.



ECNS



“ The ECNS and our Registered Nurses enable us to exceed our IHI Quadruple Aim goals of improving care, patient and provider satisfaction, and simultaneously lowering the cost of health care. ”

Jonathan D. Washko, MBA, NRP, AEMD AVP of Operations
Center for EMS | SkyHealth
Northwell Health

When the protocol-based approach to organizing triage, content is compared with the guidelines approach, the former offers clear benefits. In particular, the structured question sequence inherent to the clinical protocols minimizes errors caused by forgetting to ask question, not accounting for a caller's underlying illness, changing the order of questions (which can result in incorrect inferences about illness severity), or the presence of bias or simple poor judgment on the part of the call handler. The structured question sequence inherent to protocols also assures excellent triage support in inexperienced RNs, and it facilitates process improvement efforts by simplifying and codifying the triage process itself.

Should another protocol get selected partway through the current protocol, answers to questions appearing in the new protocol which already had been explored in the previous protocol will be highlighted, ensuring they do not get asked again. Importantly, not all triage content is structured this way. Some triage content (known as guidelines, or guideline-based products) simply list possibly pertinent questions in a menu and invite the clinical telephone advisor to ask some or all of them, in any order chosen.

The Clinical governance of the ECNS protocol set is a function of the IAED since 2011. The same body that oversees the clinical governance of the MPDS system. The College of Fellows is the standard-setting body of the Academy. The College is a scientific body of international experts, which maintains the clinical integrity of the protocols. The Mission of the College of Fellows: “To conduct an on-going review of the current standards of care and practice in ECNS, Emergency Medical Dispatch, Fire, Police, and other areas of public safety telecommunications and evaluate the tools and mechanisms used to meet or exceed those standards.”

The Academy maintains a single Unified Protocol set, with no variants, which introduces changes to the standards in an orderly manner which is then provided to all users of the protocols throughout the world. Because all communication centers everywhere use the same protocol, the valuable experience, useful ideas, and specific research from each center can then be shared with all protocol users around the world via the submission of **Proposals for Change (PFC)**.



PFCs are first reviewed by a group of experts known as the Raters. The Raters is a subcommittee of the Council of Standards that gives an initial rating to each PFC. The rating system helps the council arrive at effective decisions and provides early identification of PFCs that require further research. The rated PFCs are then passed on to the Readers Group of the Council of Standards.

They research, evaluate, discuss, and debate each PFC to determine its clinical and functional soundness, dispatch relevance, and potential for logical implementation in to the ECNS. The Readers Group is responsible for accepting, modifying, rejecting, or referring to the Research Council each of the PFCs received between protocol versions. These volunteers meet once or twice between protocol versions. The Academy also has several specialty councils (resuscitation, obstetrics, and special rescue to name a few) that may meet separately when their specific expertise is needed.

After the Readers have completed their work, the Research and Standards team begin the production cycle for the new protocols. Each approved PFC is converted into an internal proof sheet which gives detailed instructions for the precise changes required by the PFC and provides area for each specialist in the production cycle to implement, test, and sign off.

When the full Council of Standards votes on the new protocol version, any issues, concerns, or no votes received from this broad group of international experts are considered and worked out by the Rules committee. Eventually, as proof sheets are finalized the Academy opens up the software protocol to beta sites for testing. Beta testing provides a very important check and balance system.

Meanwhile, the Curriculum Boards are making updates to their course materials including instructor slides, course manuals, certification exams, recertification exams, and case entry pads to name a few. Concurrently, translators busily adapt all of these materials into multiple languages and dialects. Once the protocols have been thoroughly tested and determined to be complete, the entire protocol is then sent to full Council of Standards for formal voting. A 75% or greater approval must be obtained for the protocols to be ratified.

After council approval, the IAED then calls for the International Cultural Committees of the Council of Standards to formally review the new protocol for all language and cultural-based nuances before the protocols are officially released in different languages throughout various countries. Instructors are certified through the academy and new content is covered by IAED sponsored Instructor Workshops to keep all instructors apprised of any changes and additions.

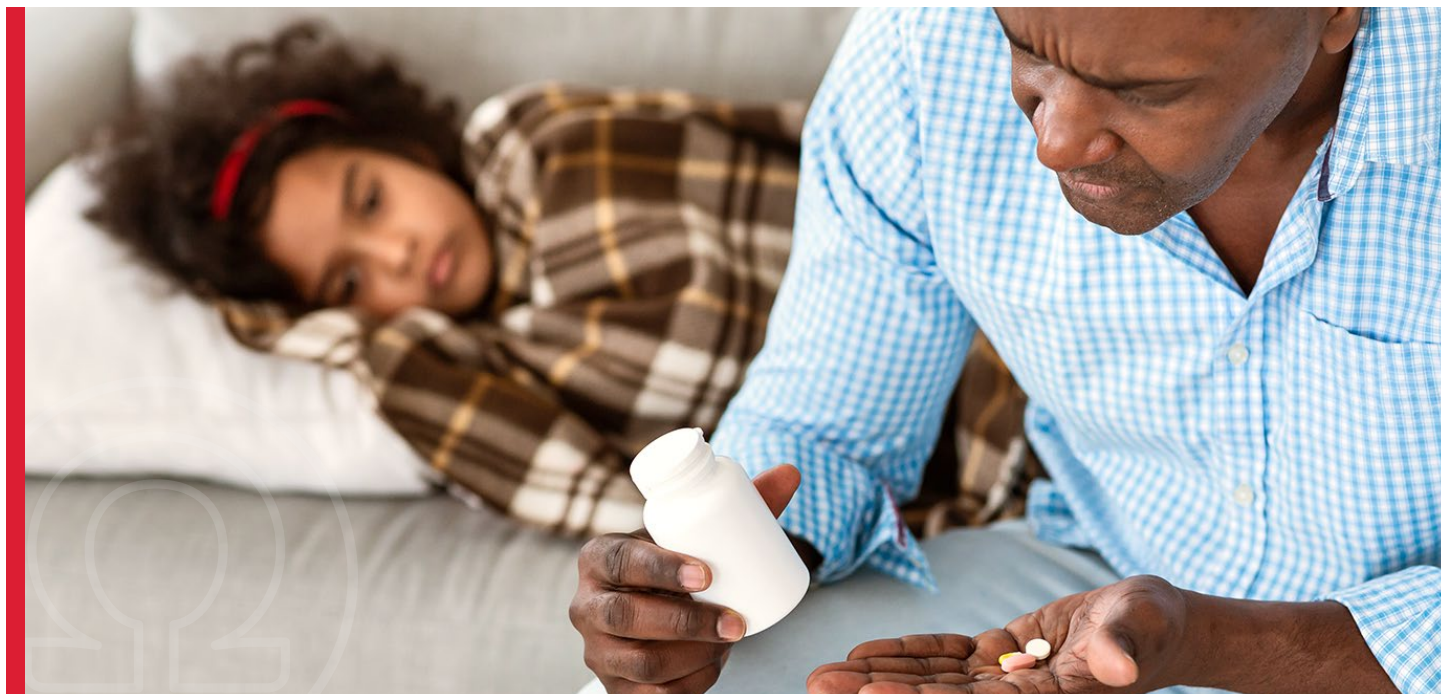
LOWCODE CAD INTERFACE

A proprietary interface specification (V1.6) exists (this is shared with your CAD vendor once they signed an integrator's agreement) in order to facilitate the bidirectional communication between CAD and LowCode facilitating the workflow of the clinicians using LowCode.

This interface implementation will include the use of LowCode as a secondary telephonic triaging tool in conjunction with the implementation of the OMEGA protocol on the 911 call processing. Calls received by 911 will use CAD and then ProQA to assess the emergency. If the call is of a low acuity nature, the call will be referred to LowCode to further triage the caller/patient to determine the most appropriate level of care needed (from self-care up through ambulance attendance - urgent or routine transport).

LowCode interfaces directly with CAD at a stand-alone server workstation and through a TCP link between CAD and LowCode. This interface has been developed as part of the overall strategy for a phased implementation. CAD retains control of the case through the final processing of LowCode. There will be a series of XML-based messages delivered via TCP/IP between CAD (as Client) and LowCode (as Server). These various messages will control the progress of the CAD case from one stage to the next.

An encrypted file is generated to manage the passage of eligible codes from ProQA to LowCode via the CAD interface. This same encrypted file allows a visual change to those codes identified as eligible in order for the EMDs to be aware of the nature of the code reached within ProQA and its eligibility for triage on the ECNS desk.





AQUA QUALITY MANAGEMENT, QUALITY ASSURANCE AND QUALITY IMPROVEMENT

Effective quality management and quality assurance are essential for developing and maintaining excellence. It is by applying and adhering to established standards that emergency dispatch agencies can improve and drive performance—ultimately benefitting the communities they serve.

Clinical Call-taking actions (audio recording and documentation) are measured against a set of standards determined by the International Academies of Emergency Dispatch. Software generated reports (AQUA™) are available showing compliance to the set of standards for trending purposes and individual clinician feedback.

ECNS Performance Standards Ed. 4.2 is our latest set of performance requirements for secondary telephonic triage calltaking. These requirements are now integrated into AQUA 7 Ascent and used to review recorded secondary telephonic triage emergency calls for quality. Together, ECNS Standards Ed. 4.2 and AQUA 7 Ascent represent a new era of case review and quality management, focusing on overall performance, not just deviations.

With ECNS Standards Ed. 4.2, the IAED is introducing a strengths-based approach to case review feedback, intended to facilitate a more positive QA/QI process. The latest standards are shorter, clearer, and fully integrated, so calls can be reviewed more accurately and quickly. Plus, utilizing our research-supported random and focused reviews, the latest standards reduce the number of cases required for review in most agencies.

TRAINING

ECNS TRAINING AND CERTIFICATION

Standardized training and certification for clinicians using ECNS occurs through the International Academies of Emergency Dispatch (IAED).

IAED certified courses for RNs include:

- EMD Course (3 days)
- ECNS Course (3 days)
- ECN-Q Course (2 days)
- AQUA for ECNS Course (4-6 hour course)

An IAED approved Train the Trainer program is also available ensuring the agency has access to IAED certified inhouse ECNS Instructors.

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