The Circle of Learning
in emergency medicine and healthcare education

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THE NEED

The primary challenge for emergency healthcare personnel is to provide the best possible treatment. This can only be expected from individuals who are highly motivated, and whose clinical practice is based on the latest knowledge, refined personal skills and efficient team cooperation.

True competence is the effect of suitable learning and practice. A process to acquire and maintain desired competence in emergency medicine is defined by the Circle of Learning.

Since health care institutions around the world are constantly striving to achieve more with less, suitable learning must be efficient, which means that defined learning objectives must be achieved with a minimum of resources. Training must also be effective, meaning that it should have a clear, positive impact on the learners’ clinical practice.

This paper discusses possibilities for achieving desired efficiency and effectiveness of training following the Circle of Learning approach.
The Circle of Learning defines five segments or steps to reach the desired competence. Each step focuses on the learner as the immediately active partner. The teacher is seen primarily as a facilitator. The steps can both be seen as a description of a process, but also as singular learning approaches to meet specific learning objectives.

**Knowledge Acquisition**

Emergency medical personnel must be able to recognize conditions in need of emergency treatment. This ability requires comprehensive knowledge.

Individual learners can acquire the necessary knowledge by accessing suitable sources such as recommended books, journals, Internet sites, etc. A facilitator could be an “on demand” learning source.

Knowledge acquisition is further stimulated by engaging learning processes and self-assessment. Results could also be documented in a self-administered knowledge check, or in a test offered by the facilitator.

**Skills Proficiency**

To master defined skills is essential for emergency medical personnel in order to provide adequate treatment, whether working alone or in a team. Personal skills can be acquired by individuals in self-directed hands-on practice. Refinement of skills may require supervision. Team skills, such as efficient communication, should be learnt by teams.

After initial learning, considerable practice is needed to master and maintain the skills sufficiently well.

**Computer Simulation**

Computer simulation offers unique interactivity with a visualized learning program that simulates real patient cases. Such programs are particularly suitable for decision making and procedural training. Use is preferably allowed at any time and from anywhere.
Simulation in teams
Every day emergency medical personnel have to interact and work together as teams in order to save patients’ lives. Realistic simulation training in teams can contribute decisively to reduce human error.

For simulation training in teams to be both efficient and effective four principles must be followed:

a. Select teams so that those who work together also train together.

b. The simulated patient or “simulator”, and the training scenarios must be realistic. The environment should closely resemble learners’ work place.

c. The relevance of the training must be secured by clear and unambiguous learning objectives.

d. Suitable debriefing provides objective assessment of individual and team training. Such debriefing has been proven to enhance learning results decisively.

Clinical Experience
Learning by apprenticeship is a classical educational method in healthcare: Juniors watch seniors perform, then perform under supervision and guidance before eventually being left to perform on their own.

Learning by apprenticeship will remain important. However, available learning resources are always scarce, and not everyone will get enough practice before being expected to demonstrate proficiency. This is a sound basis for applying the Circle of Learning approach to mastering medical emergencies.

INDIVIDUAL VERSUS SOCIAL LEARNING

In most educational literature two major perspectives stand out clearly. The Cognitive perspective states that learning is a process which takes place within each individual and, hence, and, hence, less focus is on context or social parameters. The Socio-Cultural perspective emphasizes cultural and social factors when explaining learning efficiency and effect.

However, one does not necessarily exclude the other. The two perspectives are in many ways complementary, and should both be included in a systematic approach to learning.

As can be seen, most of the right hand side of the Circle of Learning shows how individuals can gain knowledge and skills, whereas the left hand side shows how to apply personal competence into a team (social) setting.
COGNITIVE VERSUS TACTILE LEARNING

Learning can be cognitive or tactile (hands-on). Healthcare personnel must obviously know what to do. They must also be able to merge knowledge with skills, or how to, since medical procedures are a combination of a mental “strategy” and a physical “execution”. Physical execution is dependent on skills developed through training and practice.

The Circle of Learning should also be regarded as an extension into a spiral. Then it becomes clear that it also offers an approach to continued learning resulting in a higher level of proficiency. This helps trained healthcare providers to become experts in their fields. Such an approach can also be appreciated as a measure to bridge the traditional gap between education and practice.

SYNCHRONOUS VERSUS ASYNCHRONOUS LEARNING

The Circle of Learning can also help determine when learners should be together (synchronous learning) and when they had better be left to learn at an individual pace, sometimes also irrespective of place (asynchronous learning).

The right half of the Circle of Learning describes learning activities that gives the possibility for individual learning. Knowledge acquisition, skills proficiency and computer simulation can all be self-directed learning activities. Technology provides excellent possibilities to automatically check and report the level of competence acquired through such individual learning activities.

The left half of the circle shows activities suitable for synchronous learning, as is described under steps 3 – 4 above.

LEARNING FOR “JUST-IN-TIME” VS. “JUST-IN-CASE” PREPAREDNESS.

Retention studies more often than not show that emergency medical knowledge and skills tend to decay over time. While some items may “stick” very well, others require continual refreshing.

Refreshing is needed to be well prepared for a possible situation (“just-in-case”) or a planned situation (“just-in-time”), as is evident from the following examples:

An EMT or critical care nurse is generally likely to be faced with cardiac arrest emergencies and must therefore remain proficient in CPR at all times (“just-in-case”).

A paediatric anesthesiologist who knows he will be involved in a difficult surgical procedure the following day, should gather the team that will assist during the procedure to practice handling a similar case (“just-in-time”).

... Medical procedures are a combination of a mental “strategy” and a physical “execution”
Learning objectives represent the direct link between learning as a continuous process and the defined need for a specific competency.

**THE VALUE OF LEARNING OBJECTIVES**

For learning to be effective and efficient, clear and unambiguous learning objectives should be stated. Criteria for good learning objectives are:

- Observable
- Measurable
- Learner-centred
- Action-oriented

Within each of the five segments or steps in the Circle of Learning there is a need to define learning objectives that closely relate to the desired improvement of competence and clinical outcome. Here are some examples of good learning objectives within the step “Skills Proficiency”:

- Performs CPR according to resuscitation guidelines
- Demonstrates correct, manual blood pressure measurement
- Demonstrates correct placement of AED pads

Learning objectives represent the direct link between learning as a continuous process and the defined need for a specific competency at a particular ward or as part of a specified position, i.e. EMT or anesthesiological consultant.

**THE UTSTEIN FORMULA OF SURVIVAL**

The Formula of Survival predicts survival chances in a society as a product of three factors in that society:

- Medical science
- Educational efficiency
- Local Implementation

We recognize that the latest medical science is available anywhere in our global age.

Educational efficiency can be achieved by well defined educational goals, well designed educational programs and tools used in a competence building process, and finally by close monitoring of goal achievement.

Local implementation expresses a degree of preparedness as the relative spread and integration of emergency medical competence, tools and infrastructure.

A factor expressing likely survival can be calculated by the following equation:

If a society has only a 10% (0.1) score for each of these factors, the relative chance of survival a medical emergency 0.001 (0.1 x 0.1 x 0.1).

If another society has reached a score of 50% score for each factor, predicted relative surviving chances would be 0.145.

The Circle of Learning has a bearing on all of these factors by helping select both the appropriate educational content, the most efficient educational approaches and methods, and by ensuring sufficient spread of competence and treatment tools.
CIRCLE OF LEARNING AS A TOOL FOR EFFECTIVE AND EFFICIENT LEARNING

The Circle of Learning can be used as a highly effective tool for analysing learning needs. When doing so, each step in the model can be used as a starting point for designing precise learning objectives. Only after such learning objectives are clearly defined, is it appropriate to look for products or content that can address the defined learning needs.

Below is an example showing how The Circle of Learning is used as the basis for designing precise learning objectives which, in turn, are used to choose content or products that can address the learning objectives.