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PASSING ON INFORMATION
FOR THE INTERNATIONAL COMMUNITY
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ABOUT CURRENT EVENTS AND PRODUCTS
FROM VIDACARE CORPORATION.

EZnews



*Maja Ewert, anaesthesiologist
at Varberg hospital.*

In the pre-hospital setting, success rate and time needed for vascular access is crucial in the emergency patient under resuscitation.

However, IV access can also be difficult to obtain within the hospital, especially in dehydrated or hemodynamically unstable patients.

In this issue of EZNews, we have visited three hospitals in the western part of Sweden where the EZ-IO is used on a regular basis. In contrast to many other countries, the nurses are allowed to use the EZ-IO after delegation and IO placement has really become a nursing skill rather than just a physician skill.

The EZ-IO system was introduced in Sweden in 2005. Today 75 hospitals and 90% of the ambulances are using it.

New ways of working at Varberg hospital

The basic knowledge that venous access can be easily established with the EZ-IO system has changed the way of working for Maja Ewert. She is working as an anaesthesiologist at Varberg hospital.

Although there are nearly 170 000 inhabitants in the catchment area, there is no paediatric

ward at Varberg hospital. Therefore Maja Ewert and her colleagues have to be prepared and trained to take care of seriously ill children. These patients almost always need transportation to the Paediatric Clinic in Halmstad or the Children's hospital in Gothenburg, both an hours' drive away.

"Previously, we wouldn't leave until we had established venous access, since it is difficult to place a peripheral venous catheter during

transport. Sometimes it took quite a while before we could leave. Now, I wouldn't hesitate to leave without venous access since I know it would not be a problem placing an EZ-IO in the ambulance should it be necessary."

Children who are known to be difficult to gain venous access on, such as children with certain chronic diseases, are also patients in whom Maja Ewert uses the EZ-IO and children with cardiac arrest. ▶▶

"Fortunately, cardiac arrest in children is very unusual, but when it happens I would never even consider anything else than gaining vascular access via the intraosseous route."

Maja Ewert is a certified APLS (advanced pediatric life support) instructor and a pediatric AHLR (advanced heart lung rescue) instructor. Training on the EZ-IO system is included in these courses. Maja Ewert thinks that the general opinion on intraosseous access has gradually become more positive. Previously, many of her colleagues hesitated to use the EZ-IO, especially on conscious patients. According to Maja Ewert, the indication should always be re-evaluated for patients who are awake, but if there is indeed an acute need for venous access and it cannot be established in any other way one shouldn't hesitate using the EZ-IO.

"The mistake sometimes made was not to anaesthetize the bone marrow enough. But with a patient who is awake there is always time to wait a while for the local anaesthetics to have its effect. Many people are also somewhat reluctant to use the humerus as injection site because it is a new approach and because of the need to

immobilize the arm in conscious patients. However, there is a lot to gain using this site. The onset of effect on the heart is more rapid and the flow is greater."

Since the EZ-IO system was introduced at Varberg hospital, Maja Ewert seldom uses central venous catheters (CVC) in emergency care.

"There are substantial risks with CVCs and in my opinion the indication for CVCs in emergency care has been replaced with EZ-IO. One risk that I can see associated with the EZ-IO is over use, because it is so easy to handle!"

Is it possible to drill 430 holes with an EZ-IO into a raw egg?

Check for yourself at <http://www.youtube.com/watch?v=imYFiLIS5Q8>

The nurses should be the EZ-IO experts

There are several good reasons to use the EZ-IO system inside the hospitals. There are patients who don't have a minute extra to wait for a conventional needle, and sometimes, even operations are cancelled due to problems gaining vascular access.

Per Eriksson, anaesthesiologist at the intensive care unit at Sahlgrenska University Hospital, Mölndal, always uses EZ-IO for patients with sepsis and for patients with status epilepticus.

"Patients with sepsis are often dehydrated, they may have life threatening arrhythmias and they



are close to cardiac arrest. When things happen to these patients, they happen very fast. In status epilepticus the seizures simply don't stop and sedatives need to be administered without delay otherwise there is a significant risk for brain damage."

There is an on-going discussion around the EZ-IO being used also in non-acute conditions.

"Instead of sticking a patient maybe ten times in order to place a peripheral IV I think there is enough reason for choosing an EZ-IO. If, in addition, there is a whole operating team waiting, it costs a lot of money. With an EZ-IO the patient is quickly anaesthetised, and once asleep the vessels expand enough for a venous catheter to be placed."

Per Eriksson has not yet, himself, used the EZ-IO in obstetrics and childbirth, but he states that having access to the EZ-IO system in the delivery ward is a definite must.

"In case of placental abruption, rupture of the uterus or serious cases of pre-eclampsia with seizures there is no time to waste. The baby has to be got out immediately. The mother needs to be anaesthetised for an emergency caesarean section and the EZ-IO is the quickest way."

Gothenburg is the only place in Sweden that has an ambulance with a doctor onboard, and Per Eriksson's time is divided between the hospital and the ambulance. It is called out as



the second ambulance to accidents, cardiac arrests and incidents where children are involved.

"These ambulances are equipped with EZ-IOs, and I know there is a great demand for it also in the other ambulances. It is very frustrating for my colleagues to know that things could have been done, had only the right equipment been there. Especially, this is tough when you try to take care of a child with cardiac arrest without the means to gain vascular access."

He doesn't think it would be realistic to demand that every doctor should master the EZ-IO technique, but the nurses should.

"Most doctors do only part time at the emergency unit where most EZ-IOs are used, and you could not ask of them to keep up the skills to do it. I think that the nurses are the ones to be the EZ-IO experts. In many countries only doctors are allowed to place EZ-IOs and I really don't understand why, says Per Eriksson who, himself, started his medical career as a nurse. It is so much easier to use the EZ-IO than any other system for IO access and there are simply no medical risks. You just have to learn how to place the needle and those skills take no more than 15 minutes to achieve. Of course, there are some doctors who should know the system enough never to hesitate placing an EZ-IO when needed, and they are the anaesthesiologists, surgeons, paediatricians, internal medicine and the emergency physicians."

Per Eriksson, anaesthesiologist at the intensive care unit at Sahlgrenska University Hospital, Mölndal



NEW CLINICAL PAPER

Resuscitation in massive obstetric haemorrhage

A 38-year-old woman delivering her second child by emergency caesarean section experienced a massive haemorrhage 30 minutes postpartum. Rapid fluid resuscitation was limited by the capacity of the IV cannula in place and the difficulty to establish additional vascular access. Several personnel tried to establish peripheral (all four limbs) and central venous access simultaneously but without success.

A number of measures were taken in parallel to control the haemorrhage, including bimanual uterine compression and additional oxytocin. These events triggered the hospital's major obstetric haemorrhage protocol and the ICU personnel were involved. They confirmed the urgent need for intravascular access to permit rapid fluid resuscitation.

An intraosseous needle (EZ-IO, Vidacare) was obtained from the institution's emergency department and placed at the first attempt in the patient's proximal humerus. Via this route the administration rate of resuscitation fluid more than doubled. Within five minutes central volume



was filled enough to facilitate the insertion of a subclavian central line. Following the placement of a third reliable peripheral intravenous line, the intraosseous needle was removed. After two hours of surgery and finally hysterectomy haemostatic control was achieved.

The authors reporting on the case conclude that the rapid use of an intraosseous needle was a key element in the initial resuscitation process.¹ The patient was treated at Worthing hospital, Worthing, UK.

1. Chatterjee et al. *Anaesthesia* 2011; 66: 306-310

"An excellent system for quick drug delivery"

Apart from trauma patients where gaining vascular access via a venous needle may be difficult, a patient with cardiac arrest is the typical patient where an EZ-IO is vitally needed, according to Patric Antonsson, registered nurse and trauma supervisor at the Emergency Ward at the Sahlgrenska university hospital in Gothenburg.

"The EZ-IO system is excellent for quick drug delivery. In a patient with cardiac arrest it is often difficult to place a venous needle since the patient may be in shock and the blood volume concentrated to central parts of the body."

Patric Antonsson is responsible for the annual trauma care training of the emergency ward staff. Among other things, he teaches his colleagues how to use the EZ-IO system. Placing an EZ-IO is seldom a problem for anyone.

"Drilling the EZ-IO in place is a controlled process. First attempt precision is very high. It is a perfect help when it is not possible to place a peripheral venous catheter immediately."

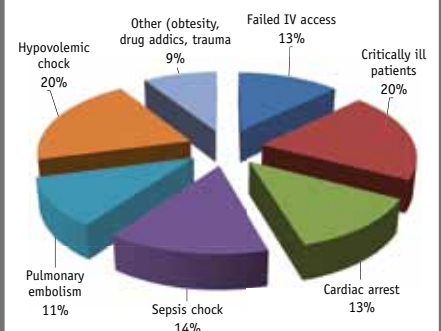


Patric Antonsson, registered nurse and trauma supervisor at the Emergency Ward at the Sahlgrenska university hospital in Gothenburg.

Patric Antonsson can see a need for the EZ-IO system in other places of the hospital than the emergency ward. He suggests keeping it in the emergency kit where it is easily accessible. ■

The EZ-IO is standard in more than nine out of ten Danish emergency departments

A questionnaire was sent to 20 emergency departments throughout Denmark to evaluate the use of intraosseous infusions. Intraosseous devices were available in 74% of the 19 departments that answered the questionnaire (95% response rate) and of these 95% used the EZ-IO as the standard device. The most common causes for IO use were hypovolemic shock or when patients were critically ill, followed by sepsis shock.



Molin et al. *Scandinavian Journal of Trauma, Resuscitation and Emergency Medicine* 2010, 18:37

Distal femur – new insertion site for IO access in children

Since April 2011 the distal femur is an additional certified insertion site for EZ-IO access in children. The clearance applies to countries in the European Union working under the CE mark. Expanded clearance includes distal femur insertions in pediatric patients allowing physicians an additional site for consideration when treating patients.

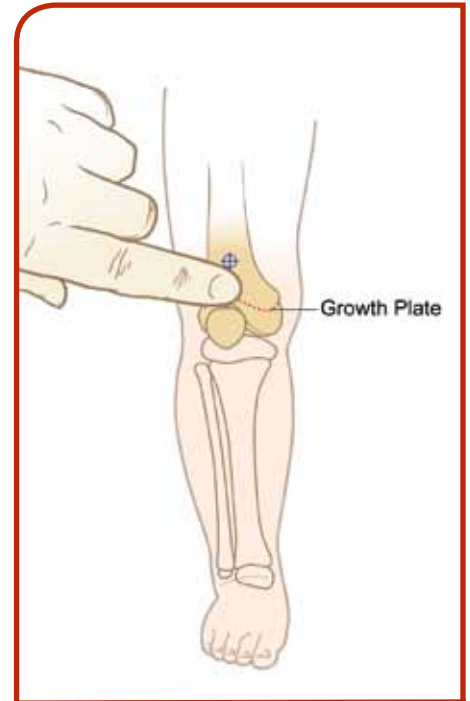
The distal femur is relatively large, target area measuring approximately 3 cm in length and 2 cm in width for a 3.1 kg infant. In fact, the distal femur is the largest target area in infants and thus, may be easier than alternate sites for clinicians to access. For IO insertion in the distal femur, the index finger is used to palpate the patella and also to identify the femur midline anteriorly.

In addition to distal femur, proximal and distal tibia are approved sites for pediatric use

of EZ-IO. Proximal humerus should only be used in patients whose landmarks can clearly be identified. As with all patients care should be taken to only place minimal pressure on the Driver during insertion and let the driver do the job. With smaller and softer pediatric bones it is even more important to avoid excessive pressure. Use of the EZ-Stabilizer is strongly recommended for all sites in pediatrics. The insertion site should be frequently monitored for extravasation. Extravasation may occur from incorrect use, for example from a misplaced needle, from multiple attempts in the same bone, or from movement of the needle enlarging the penetration site.¹

Contraindications for use of the EZ-IO device are fracture; excessive tissue or absence of anatomical landmarks; infection at the area of insertion; previous, significant orthopedic procedure at the site (IO in past 48 hours, prosthetic limb or joint).

1. LaRocco BG and Wang HE. *Intraosseous Infusion. Prehospital Emerg Care. 2003;7(2):280-85*



Extended dwell time for EZ-IO

The EZ-IO has received expanded CE marking for an extended dwell time of no greater than 72 hours for intraosseous placements.

Extended dwell time allows medical personnel additional opportunities to use the IO route to establish and maintain vascular access and enhance patient outcomes. With the extended dwell time, EZ-IO is an even more suitable alternative for patients requiring emergency vascular access but not a central line for sustained therapy.

For patients requiring a central line, EZ-IO could be placed during resuscitation and later replaced with a central line under sterile best practice circumstances.

Given the well-established use of intraosseous vascular access in the emergency setting, the U.S. Nursing Consortium on Intraosseous Vascular Access in Healthcare Practice has recommended to go beyond the use of IO in resuscitative settings and to consider IO as an alternative wherever vascular access is medically necessary or difficult to achieve. Also the EZ-IO should be considered in intensive

care units, on high acuity/progressive care units, on the general medical units, in preprocedure surgical settings where lack of vascular access can delay surgery, and in chronic care and longterm care settings.¹

The extended dwell time for EZ-IO can be especially useful in situations such as palliative care and in patients with severe burns.

1. Phillips, L et al. *Recommendations for the Use of Intraosseous Vascular Access for Emergent and Non-emergent Situations in Various Health Care Settings: A Consensus Paper. Journal of Infusion Nursing. 2010; 33(6):346-351.*

Established in 2001, Vidacare Corporation is the developer of a broad technology platform that is defining the field of intraosseous (inside the bone) medicine. Current applications include vascular access, emergency and disaster medicine, oncology and spinal surgery. Vidacare's focus on enhancing clinical efficacy, patient safety and comfort, and reducing complications and their associated costs, has resulted in its devices becoming the recognized technology standard. Privately held, the company is based in San Antonio, Texas, and its products are marketed in over 50 countries worldwide.

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