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Medical ultrasound on cruise ships

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In this issue of "International Maritime Health" Boniface et al. [1] report a case where an ultrasound examination performed aboard a cruise ship triggered an emergency medical evacuation of a young female crewmember. The ship's doctor identified an ectopic pregnancy by ultrasound and the diagnosis was confirmed by remote tele-medical review of the images. The authors emphasize that point-of-care ultrasound examination can remove uncertainty from the decision to urgently evacuate, and they make a compelling plea for all cruise vessels to have ultrasound equipment and staff with skills to use it and to correctly interpret the findings.

Sonography on cruise ships is not a new idea, but it has been slow to catch on. When the then Japanese-owned *Crystal Cruises* brought out its first luxury vessel in 1990, its Medical Facilities had an ultrasound device. It was bulky and not very user-friendly, and the ship's doctors had limited or no hands-on ultrasound experience. Sonography was therefore rarely attempted, and the images had never any decisive influence on patient handling.

Curiously though, once in the early years, a passenger couple presented in the Medical Facilities of *Crystal Harmony* shortly after embarkation to have the wife's vague abdominal discomfort sorted out. When the husband, a radiologist, saw the ultrasound device, he wanted to use it to exclude acute appendicitis. He found nothing abnormal, but the ship's doctor was not convinced and — considering the ship's immediate itinerary — insisted on a port referral. A few hours later the ship left for its scheduled 2-week cruise to remote Antarctica — without the couple, but with a very relieved medical staff aboard. Ectopic pregnancy had been diagnosed by ultrasound ashore and treated surgically there.

Not long after this incident the device was removed from *Crystal Harmony*, and ultrasound equipment was not even ordered for the company's next two vessels.

But that was long ago, and — as Boniface et al. [1] write — ultrasound equipment has evolved rapidly over the past two decades. The devices have become smaller and far easier to use, they are more portable and durable, and the relative cost has decreased considerably. Basic ultrasound is now part of medical education and advanced training is done during emergency medicine and other specialisations in many countries.

Hence, ultrasound is now a low-cost, reliable, diagnostic tool that can be used on cruise ships by bedside providers with some focused basic skills, in particular when ultrasound expert backup is available from Tele-Medical Assistance Services (TMAS) ashore, as in the case of Boniface et al. [1].

They state that medical care aboard cruise ships follow guidelines from the American College of Emergency Physicians (ACEP) and suggest to include point-of-care ultrasound in future revisions. It may not be instantly clear to international readers why the authors refer to a document from a **national** association.

The reason is simple; there are no **international** rules and regulations dealing with the practice of cruise ship medicine. International organisations, like the International Maritime Organisation (IMO), have never shown much interest in the practice of cruise ship medicine. Maybe this will change in the near future, following the intense media attention of the recent coronavirus (Covid-19) outbreak on M/S *Diamond Princess* [2].

Let's return to the early 1990s, when mass cruise tourism was in its infancy. Some members of ACEP had briefly worked on cruise ships and been appalled by the low status of ship's doctors and poorly equipped ship infirmaries. To remedy that and seeing cruise ship medicine as an attractive alternative career path for emergency physicians, they started in 1990 a Section for Cruise Ship and Maritime Medicine within ACEP [3].

While creating guidelines for cruise ship medicine, the Section initially suggested that only United States (US) trained emergency physicians should be hired as doctors on cruise ship since most cruise passengers were American. ACEP had to turn that proposal down because very

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few cruise ships were US registered, and most ship doctors were non-US citizens. In 1995 ACEP published its first "Health Care Guidelines for Cruise Ship Medical Facilities", the result of consensus among active ship's doctors. They were very basic, specified just a few laboratory tests, and X-ray equipment only on ships delivered after 1997 [3]. But they were still strongly opposed by the cruise industry that did not want any focus on illness aboard ships and worried about costs and potential liability.

Nevertheless, over the ensuing years it became apparent that cruise ship doctors and the industry had common goals, and for many years ACEP has collaborated with the Cruise Lines International Association (CLIA) to further develop and implement the Guidelines. Representing more than 95% of global cruise capacity, CLIA is the world's largest cruise industry trade association and focused on passenger satisfaction, particularly regarding service, safety, security and health [4]. As they are now mandatory for CLIA oceangoing Cruise Line Members, the **ACEP Guidelines can be considered a minimum global industry standard.**

In the 2019 revision of the ACEP/CLIA Guidelines, a comprehensive document, ultrasound equipment is not mentioned. Guideline 8.1. on imaging states "X-ray imaging capabilities which includes one X-ray generator and one processing/developing system" [3]. Hence, at this time it is up to each cruise company to decide on ultrasound use.

Getting the necessary ultrasound equipment on board all cruise ships and ensure proper training and skills of all present and future cruise ship doctors will be a formidable undertaking. Yet the German Maritime Medical Association, another **national** organisation, has issued guidelines that make ultrasound and medical staff qualified to use it **mandatory** on (the few) cruise vessels registered in Germany [5].

Whether ultrasound equipment is included in cruise ship medicine guidelines or not, there will be an increasing number of ships that will carry it and ship's doctors that will use it. Therefore maritime TMAS around the world must already now prepare for providing remote experts to direct on board less experienced ultra-sonographers to obtain and interpret images that can impact patient care in real-time, in particular in cases when urgent evacuation may be an issue.

Structuring ultrasound training into ports during turnaround, as found feasible by Boniface et al. [1], may work — for some ships in some ports. It is hardly a workable solution for the whole industry and does not meet ACEP ultrasound standards [6].

The challenge remains the training and certification programme for a global medical staff workforce and the over-reads, but it is just a matter of time before point-of-care ultrasound will be the norm on all cruise ships.

CONFLICT OF INTEREST

The author has no commercial, financial or other relationships related to the subject of this article. He has worked as ship's doctor and medical consultant for many cruise companies.

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