sedated hatchlings with midazolam 2 or 3 mg/kg IV for in-air (n = 7) or in-water (n = 11) AEP measurements, and anesthetized hatchlings (n = 5) with ketamine 6 mg/kg and dexmedetomidine 30 µg/kg IV reversed with atipamezole 300 µg/kg half IM and half IV for in-air AEP measurements. Midazolam-sedated turtles were also physically restrained with a light elastic wrap. For in-water AEP measurements, sedated turtles were submerged 14 cm and brought to the surface every 45 – 60 seconds, or whenever they showed intention signs for breathing, and not submerged again until they took a breath. Underwater tests did not exceed 60 min. Time to effect, time to full recovery, heart rates, respiratory rates, post-procedure venous blood gasses (pH, pCO2, pO2, HCO3-, lactate), number of movements disturbing AEP measurements (in-air only), and subjective quality of release were recorded. Heart rate and blood gases were measured from an additional six hatchlings after nest emergence to compare with sedated and anesthetized turtles. Both sedation with midazolam and anesthesia with ketamine-dexmedetomidine were successful for allowing AEP measurements in hatchling leatherback sea turtles. Disruptive movements were less frequent with anesthesia than with sedation in the in-air group. Post-procedure temperature-corrected venous blood pH, pCO2, pO2, and HCO3- did not differ among groups, although for the midazolam-sedated in-water group, pCO2 trended lower and pO2 varied most widely, and in the ketamine-dexmedetomidine anesthetized group there was one turtle considered clinically acidotic (temperature-corrected pH = 7.117). Venous blood lactate was greater for hatchlings recently emerged from the nest than for turtles sedated with midazolam in air, with the other two groups falling intermediate between but not differing significantly from the high and low lactate groups. All releases of hatchlings to the ocean were scored as good, except for one fair on one poor release out of 11 in the midazolam-sedated in-water group. Use of midazolam for sedating red-eared sliders (*Trachemys scripta elegans*) and snapping turtles (*Chelydra serpentaria*) has previously been described, but reports in sea turtles are lacking. Full anesthesia for in-water AEP measurements, as has been reported for larger juvenile green turtles, was not pursued for leatherback hatchlings because the small glottis and trachea posed physical limitations on protecting the airway adequately with an endotracheal tube while submerged. Sedation allowed the turtle to protect its airway voluntarily while limiting flipper movement. Midazolam or ketamine-dexmedetomidine (and reversal with atipamezole) would be useful for other procedures requiring minor or major restraint in leatherback sea turtle hatchlings and other sea turtles, although variable susceptibilities may require dosage adjustments.

VALIDATION OF ULTRASONOGRAPHY AS A NONINVASIVE DIAGNOSTIC TOOL TO MEASURE SUBCUTANEOUS FAT DEPTH IN LEATHERBACK TURTLES

Heather Harris[1], Scott Benson[2], Michael James[3], Kelly Martin[4], Brian Stacy[5], Charles Innis[6], Julie Cavin[6], Pierre-Yves Daoust[7], Paul Rist[7], Thierry Work[8], George Balazs[9], and Jeffrey Seminoff[10]

[1] NOAA Southwest Fisheries Science Center (contract veterinarian), Morro Bay, California, USA
[2] NOAA Southwest Fisheries Science Center, Moss Landing, California, USA
[3] Fisheries and Oceans Canada, Halifax, Nova Scotia, Canada
[4] Loggerhead Marinelife Center, Juno Beach, Florida, USA
[5] NOAA/University of Florida, Gainesville, Florida, USA
[6] New England Aquarium, Boston, Massachusetts, USA
[7] Atlantic Veterinary College, Charlottetown, Prince Edward Island, Canada
[8] USGS National Wildlife Health Center, Honolulu, Hawaii, USA
[9] NOAA Pacific Islands Fisheries Science Center, Honolulu, Hawaii, USA
[10] NOAA Southwest Fisheries Science Center, La Jolla, California, USA

Leatherback turtles undergo substantial cyclical changes in body condition between foraging and nesting grounds caused by periods of intensive foraging followed by prolonged fasting during migration and reproduction. These anatomical changes are characterized by alterations in body mass and morphometric measurements, prominence of dorsal carapacial ridges, and thickness at the base of the head and appendages. Ultrasonography has been used to measure subcutaneous fat depth to quantify body condition

in a variety of domestic and wild animal species, but has not been reported for use in any sea turtle species. To assess the efficacy of this technique for leatherback turtles, a total of 21 turtles were sampled, including foraging adults from central California (n = 4), Massachusetts (n = 1), and Nova Scotia (n = 5); nesting adult females from Florida (n = 8); and immature turtles from the Pacific Islands region (n = 3). Ultrasound images were obtained from four anatomical sites: dorsal shoulder, dorsal neck, lateral neck, and hind end. Ultrasound sites were chosen based upon previously identified regions of fat deposition, accessibility of the site for turtles on a nesting beach and on a capture boat, and ability of the ultrasound signal to penetrate the tissue. A SonositeVet 180 Plus portable ultrasound machine with curvilinear transducer was used to determine tissue boundaries of the epidermis, dermis, subcutaneous fat, and muscle. The thickness of each tissue layer was recorded with the machine's internal calipers. Rigid landmarks were used as reference points and multiple measurements were obtained from the same site to facilitate comparison within and between individuals. The dorsal shoulder region was identified as the best site for differentiation of tissues and appeared to be less affected by position or movement of the body as compared with the neck and hind end. Imaging through the carapace was not possible due to the tight matrix of dermal ossicles which reflected the ultrasound signal. Ultrasound measurements of subcutaneous fat depth were validated and confirmed histologically in a subset of turtles by directly measuring the fat layer at necropsy in dead turtles (n = 8) and with surgical fat biopsy of live turtles (n = 2). Potential issues causing variability with this method include operator-applied pressure of the transducer, position of the front flipper in flexion or extension, gelatinous consistency of the fat reducing accuracy of direct measurements, and degree of tissue autolysis and freeze-thaw artifact in dead animals. Ultrasound can be used to rapidly assess body condition during nesting and in-water capture operations without requiring manual restraint or disrupting normal nesting behavior. Quantitative assessment of body condition may provide valuable data that can be used in conjunction with other health parameters to facilitate global health comparisons between increasing and declining leatherback turtle populations, and may have applications for other sea turtle species.

SURGERY, REHABILITATION AND RELEASE OF A JUVENILE HAWKSBILL RESCUED FROM A LONGLINE IN THE BAHIA DE JALTEMBA, NAYARIT, MEXICO

Catherine E. Hart[1], Alan A. Zavala-Norzagaray[2], Cesar P. Ley-Quñonez[3], Paula Aguilar-Claussell[2], and Alonso A. Aguirre[4]

[1] Doctorado en Ciencias en Biosistemática, Ecología y Manejo de Recursos Naturales y Agrícolas (BEMARENA), Centro Universitario de la Costa, Universidad de Guadalajara, Puerto Vallarta, Jalisco, Mexico.
[2] CIIDIR-IPN, Unidad Sinaloa, Juan de Dios Bátiz Paredes No. 250, Col. San Joachin, C.P. 81101, Guasave, Sinaloa, México.
[3] Doctorado Regional en Biotecnología, Universidad Autonoma de Sinaloa, Culiacan, Sinaloa, Mexico.
[4] Smithsonian-Mason School of Conservation , Front Royal, Virginia, USA.

We report the treatment, surgery and satellite tracked release of a juvenile East Pacific hawksbill turtle (*Eretmochelys imbricata*) that was given to our research group after being cut from a longline by divers in the Bahia de Jaltemba, Nayarit, Mexico. The turtle was transported to the wildlife department of the CIIDIR-IPN in Sinaloa for treatment. Radiography was used to gather information on the position and size of the hook. The hook measuring 3cm was found lodged in the esophagus. The removal of the hook was complicated due to its relatively large size compared to that of the turtle (SCL: 40cm; SCW: 31cm; 5 kgs). The hook was successfully removed by making an 5mm incision through the tissue on the neck through which the point of the hook was cut allowing the subsequent removal of the shank through the mouth. After 38days to recuperate at the research center we returned the turtle named "Jaltemba" to the bay where she had been caught. Jaltemba is the first sea turtle to be satellite tracked in the state of Nayarit which resulted in the turtles release being attended by hundreds of people from the community, press (local and national) and government officials raising awareness of sea turtle bycatch and EP hawksbill turtles in the Mexican Pacific.

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Compiled by:
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75 Virginia Beach Drive
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