

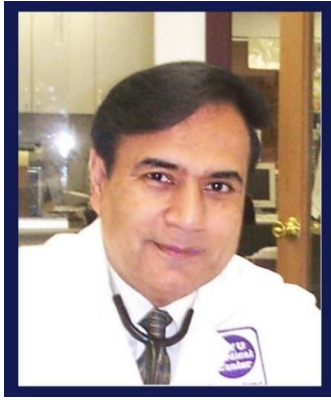


DR. HARI KRISHNA SHUKLA

**DR. SHUKLA'S WORK:
IN MEDICINE AND FOR THE COMMUNITY**



	DR. SHUKLA'S WORK: IN MEDICINE AND FOR THE COMMUNITY	
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Dr. Hari Krishna Shukla

Physician, Scholar & Community Leader

Dr. Hari Shukla is a distinguished physician, professor, and humanitarian with over four decades of contributions in Neonatal-Perinatal Medicine. He is triple board-certified (Pediatrics, Neonatal-Perinatal Medicine, and Forensic Medicine) and serves as a professor at NYU School of Medicine. With a legacy of training physicians and advancing neonatal care globally, Dr. Shukla's innovations in Pediatric medicine have shaped modern pediatric practices and followed throughout the world and millions of sick infants have been benefitted. Dr. Shukla is the first physician of Indian origin whose groundbreaking medical innovations and contributions have earned distinguished recognition both in the United States and globally. His work has set new standards in neonatal care and public health worldwide.

Medical Achievements & Innovations

- **Pioneered Surfactant Therapy (1987):** **First U.S. physician (and first Indian physician worldwide)** to use surfactant in preterm infants—now a global standard. Recognized by NY Governor, United States senate and the Congress leadership.
- **Developed Lifesaving Formulas:** Dr. Shukla's research on Umbilical Catheter Equation was published in 1986. It is used in the majority of the hospitals in United States and throughout the world. **It is estimated that over four hundred million (40 crores) sick infants have umbilical catheter insertion using Dr Shukla's equation in the world.** It is registered with American Medical Association Journal and is **free to all to use.**
- **Dr Shukla's** research on Endotracheal tube placement—now part of U.S. medical training (BLS, PALS, ACLS).
- **Polio Research:** in 1979–80 research with his mentor revealed insufficient immunity from 3-dose polio vaccines in India, leading to revised immunization strategies in developing nations. In united States **Dr Shukla received award from “Pasteur-Merieux-Connaught”, the makers of Polio vaccine, for his work toward eradication of Polio.**
- **Kernicterus & Bilirubin Research:** Advanced understanding of neonatal jaundice-related brain injury.
- **Gestational Age Assessment:** His method transformed estimation practices for preterm infants.

Dr. Shukla has published over 20 medical papers cited in major neonatology and pediatric texts.

Honors & Recognition

For his work in Pediatric Medicine and Community Service, Dr. Shukla has received numerous **Awards and Honors** such as:

- Two awards from the President of the United States of America.
- Three awards from the Governors of United States.
- Two awards from the Governors from India.
- Three awards from the Mayors of New York City.
- One award from Mayor from Ahmedabad, India
- Five awards from Senators and Six awards from Congressmembers of United States.
- About two dozen from “Not for Profit” Organizations in New York.
- Gold Medal from pediatric Society, United States.
- Bharat Gaurav and Hind Ratan Awards.
- **Liberty Award**, NY’s highest civilian honor
- **Top Pediatrician in USA** (multiple years)
- Citations from U.S. Congress, NY State Governors, and numerous community organizations
- **Gold Medal**, Queens Pediatric Society
- **Best Teacher Award**, Flushing Hospital & Albert Einstein College

Leadership & Professional Roles

- Former President, a) Flushing Hospital Medical Staff Society b) Queens Pediatric Society.
- Former Rotaract DRR (Governor), Rotary International District 305
- Founder, Children’s Medical Center, Flushing
- Civil Surgeon for U.S. DOJ Immigration Services (since 1990)
- Leadership roles in Indian Red Cross, Rotary International, and AAPI
- Dr Shukla has served as a Question Writer/Author for American Board of Pediatrics and Neonatal-Perinatal Board for several years.
- Dr. Shukla has been [the Consultant Pediatrician for over thirty- seven years for Permanent Mission of various countries to the United Nations and Consulate General of India.](#)
- Dr Shukla serves as the [Civil Surgeon for the United States](#) Department of Justice, Immigration and Naturalization service since 1990.

Humanitarian & Community Service

- Dr. Shukla has led disaster relief efforts in **India (earthquake & floods)**, **Sri Lanka (tsunami)**, and **Haiti (earthquake)** through South Asians of NY, providing medical supplies and equipment.
- He co-founded a **free breast cancer clinic** for South Asian women and helped enroll 3,000+ children in public health insurance programs.
- Dr. Shukla has devoted his time to [promote health in children](#) , [prevent gun violence](#), [prevent drug addiction](#), [prevent hatred](#), [promoting preventing screening in women and helping earthquake and flood victims](#) through his not profit organizations: 1) South Asians of new York Inc. (Founder and president) and 2) New American Voters Association, Inc.(Chairman and c-founder)

Health Advocacy & Charity

- Promoted child health via “Walkathons for Children,” anti-obesity lectures, and blood donation
- Donated trees to NYC and supported clean water initiatives in India
- Annual Christmas toy drives for hospitalized children
- Supports arts, culture, and cricket in the U.S.

Personal Life

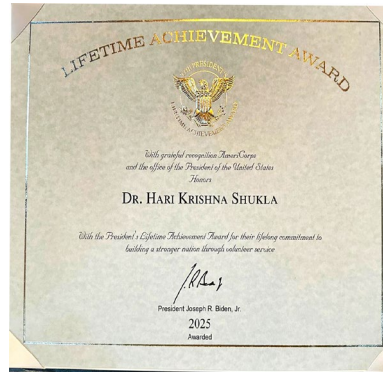
Born in India in a family of engineers, Dr. Shukla pursued medicine to serve communities. A valedictorian and Rotary International Scholar, he immigrated to the U.S. in 1980. He and his wife, Kirti, have two physician sons and five grandchildren. A former cricketer, boxer, and marathoner, Dr. Shukla enjoys music, photography, and plans to continue humanitarian work post-retirement, including with UNICEF and the UN.

	DR. SHUKLA'S AWARDS AND HONORS IN AMERICA	YEAR
1	PRESIDENT USA - LIFE TIME ACHIEVEMENT AWARD	2025
2	PRESIDENT USA - VOUNTARY SERVICE AWARD	2025
3	NY STATE HEIGHEST AWARD	2024
4	LIBERYY MEDAL	2024
5	NY GOVERNOR KATHY HOCHUL	2024
6	NEW YORK GOVERNOR ANDREW CUOMO	2016
7	NEW JERSEY GOVERNOR CORZINE	2008
8	US SENATOT CHUCK SHEUMER	2019
9	US SENATOR Leuenberg	2001
10	NYC MAYOR ADAMS	2023
11	NYC MAYOR BLOOMBERG	2006
12	CONGRESS UNITED STATES, PROCLAMATION, HON. MEEKS	2021, 2018
13	UNITED STATES CONGRESS HON. MENG	2015, 2024
14	UNITED STATES CONGRESS HON CROWLEY	2017
15	UNITED STATES CONGRESS HON. MALONEY	2019
16	UNITED STATES CONGRESS HON. THOMAS SUOZZI	2024
17	UNITED STATES CONGRESSMAN STEVE ISRAEL	2013
18	NEW YORK Leut. GOVERNOR HON. DELGADO	2022
19	NEW YORK SENATOR HON LIU	2019
20	NEW YORK SENATOR HON. KAPLAN	2019
21	NEW STATE SENATOR TONY AVILA	2006
22	NEW YORK SENATOR TOBU STAVISKY	20020&2024
23	PEDIATRIC SOCIETY GOLD MEDAL	1999-2000
24	POLIO ERADICATION AWARD	1998
25	PRESIDENT FLUSHING HOSPITAL	2005
26	DEAN AND PRESIDENT NYU SCHOOL OF MEDICINE	2008
27	PRESIDENT AMERICAN ACADEMY OF PEDIATRIC Dr. COOK	1999
28	UNITED NATIONS INTERFAITH AWARD	2024
29	QUEENS BOROUGH PRESIDENT MELINDA KATZ	2014
30	WORL BUSINESS FORUM - ACHIEVEMENT AWARD	2003
31	SUPER DOCTOR - FOUR TIME	2004 TO 2008
32	THE PHYSICIAN OF THE YEAR, FLUSHING HOSPITAL	2002
33	BEST TEACHE OF THE YEAR	1992-1993
34	NATIONAL LEADERSHIP AWARD	1997 & 1998
35	NY TIMES-MAGAZINE NY BEST DOCTOR	2005 TO 2012
36	NASSAU COUNTY EXECUTIVE BRUCE BLAIKMAN	Jan-24
37	TOWN OF OYSTER BAY - JOSEPH SALANADO	Jul-05
38	NY STATE ASSEMBLYMAN DAVID WEPRIN	2024
39	NY STATE ASSEMBLYMAN BARRY GRODENCHIC	2004
40	NY STATE ASSEMBLYMAN EDWARD BRAUNSTEIN	2024
41	NY STATE ASSEMBLYWOMAN - JENIFFER RAJKUMAR	2023
42	NY STATE ASEMBLYWOMAN MAN JULIA HARRISON	2005
43	NY STATE ASSEMBLYWOMAN MICHAELLE SOLAGES	2019
44	NYC COUNCILMAN PETR KOO	2020
45	COUNCILMAN THOMAS HAND	2,023
46	COUNCILMAN LOUS IMBROTO	2023
47	NYC COUNCILMANSTEVEN LABRIOLA	2023
48	NYC COUNCILWOMAN ELIZABETH CROWLEY	2005
49	CONSUMERS RESEARCH COUNCILOF AMERICA	2005,06,07
50	OVER TWO DOZZENS AWARD AWARDS FROM "NOT FOR PROFIT ORGANIZATION IN NEW YORK.	1999 TO 2024
	DR. SHUKLA'S AWARDS AND HONORS IN INDIA	YEAR
1	HON. GOVERNOR OF GUJARAT MR. KK VISWANATHAN	1976
2	HON GOVERNOR OF GUJARAT S. MUKHARJEE	1978
3	ROTARY INTERNATIONAL PRESIDENT MR. BOMAR	1979
4	BHARAT GAURAV AWRD - NEW JERSEY	2012
5	HIND RATAN AWRD, NEW YORK	2012
6	ROTARY YOUTH LEADERSHIP AWARD	1977, 1978
7	BLODD DONATION 15 TIMES, INDIAN RED CROSS	1970-1978

RECOGNITION AND HONOR OF DR. SHUKLA IN AMERICA



AWARD FROM HON. PRESIDENT JOSEPH BIDEN



HON. PRESIDENT JOE BIDEN: LIFETIME ACHIEVEMENT AWARD:



PRSEDENT'S VOUNTEER SERVICE AWARD



NY STATE HIGHEST CIVILIAN AWARD
FIRST ASIAN AMERICAN
TO RECEIVE THIS AWARD



HON. NY GOVERNOR HOCHUL: CITATION



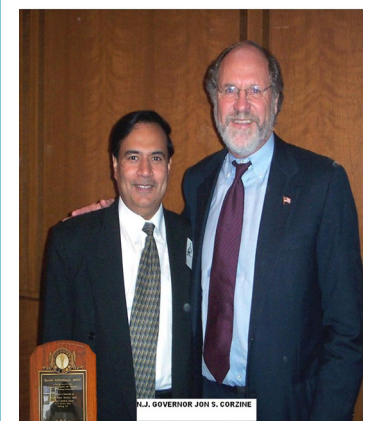
HON. NY MAYOR ADAMS : CITATION



1'ST ASIAN TO RECEIVE HIGHEST NY STATE AWARD



Hon. Governor Cuomo



HON. NJ GOVERNOR CORZINE

RECOGNITIONS AND HONORS TO DR. SHUKLA IN UNITES STATES



Abc



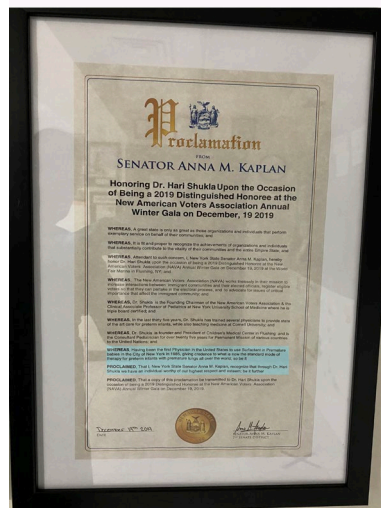
A



Hon Congressman Meeks



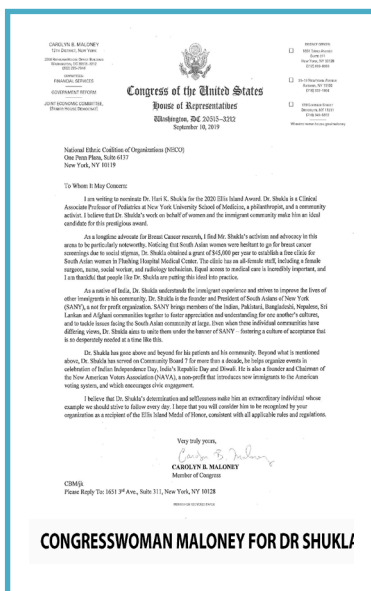
Hon. NYS Senator Liu



Hon.NYS Senator Kaplan-Proclamation



Congress of United States - Proclamation



CONGRESSWOMAN MALONEY FOR DR SHUKL/

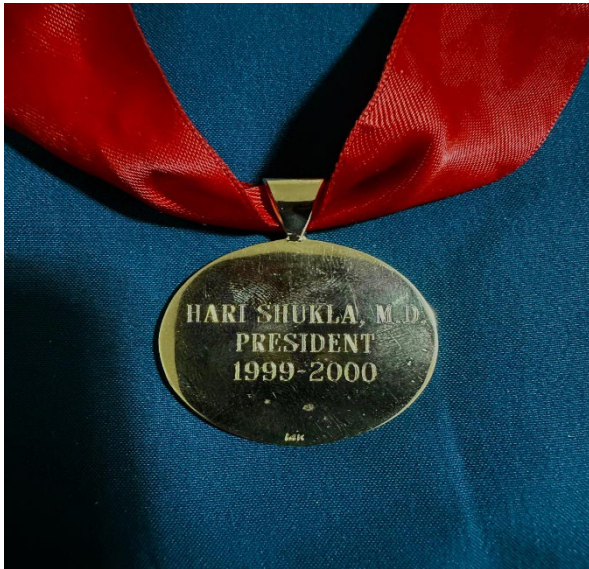


Hon. Lt. Governor -Proclamation



Gold medal and citation plaque for services to the children of Borough of Queens, New York City

RECOGNITIONS AND HONORS TO DR. SHUKLA IN UNITES STATES - 4



**MEDAL PRESIDENT
PEDIATRIC SOCIETY**



**LIFETIME ACHIEVEMENT AWART
BHARAT GAURAV**



**CONSUMER RESEARCH COUNCIL OF
AMERICA**

For immediate release
Contact: Preeti Bhat (516) 455-3479



Senator Toby Ann Stavisky Honors Dr. Hari Krishna Shukla with Liberty Medal

Dr. Shukla is the first South-Asian American to receive this prestigious recognition



Senator Toby Ann Stavisky Presents Dr. Hari Krishna Shukla with the NY Liberty Medal on the Senate floor.

ALBANY: This week, Senator Toby Ann Stavisky (11th SD-Queens) presented Dr. Hari Shukla with the Liberty Medal on the Senate floor, recognizing his life-saving work in the field of neo-natal pediatric medicine. Dr. Shukla, a Queens resident, has operated his own practice in Flushing, Queens, for more than three decades, serving thousands of young patients, with a focus on the South Asian community.

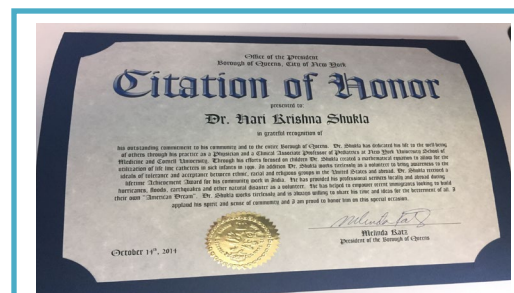
Dr. Shukla has received international acclaim for his work in advancing the science of how doctors treat infants born prematurely. Dr. Shukla is most renowned for developing a mathematical formula that helps to deliver critical fluids and medications more safely to premature children both intravenously and through the umbilical cord. Known as "Shukla's formula," the doctor's innovation improved this process by more than 25% over previous methods, helping to save thousands of lives around the world.

Dr. Shukla's life's work in the field of neo-natal pediatric medicine warrants this honor. Senator Stavisky presented the Liberty Medal, New York State's highest award, during a session of the Senate on May 15th.

SENATOR STAVISKY HONORING DR. SHUKLA



United Nations, NY: Interfaith Award



Hon. Borough President Melinda Katz

RECOGNITION AND HONOR TO DR. SHUKLA IN INDIA



HONOR BY GUJRAT GOVERNOR HON. K. K. VISHWANATHAN



HONOR BY GUJARAT GOVERNOR Mrs. MUKHARJEE



Honor by Rotary International President James Bomar



BHARAT GAURAV AWARD



RELIEF WORK BY Dr. Shukla and his team on elephant in Bihar, India 1975



GANDHI ASHRAM (AHD) TO GANDHI SAMADHI(New Delhi)
JOINED ZINABHAI NAVIK1977
As a Physician (41 DAYS)

DR. SHUKLA'S COMMUNITY
WORK IN UNITED STATES
AND INDIA

Dr Shukla is an advocate of nutrition and exercise for children. He chaired Committee on Obesity awareness of AAPI-QLI. He sponsored programs with BAPS Organization, AAPI and Pediatric society. He lectures on nutrition and activity in Temples and in public school.



Free lectures on diet and exercise in temples and in schools



Free health education in public schools



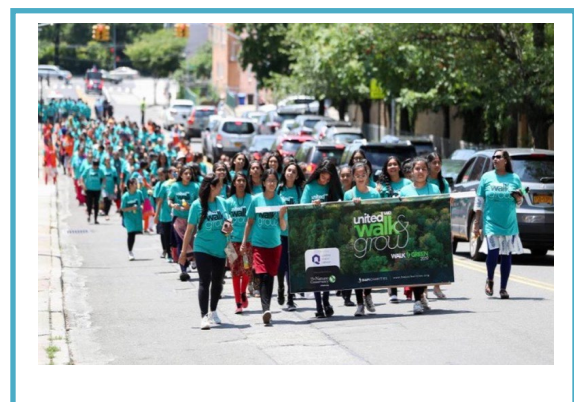
Free distribution of pedometers to children to monitor their activities.



Chairman- AAPI-QLI Obesity awareness campaign and Citation from US Congressman.



Sponsors and participants with BAPS Walkathon for over ten years in New York..



BAPS Girls walkathon

Toys Distribution in Christmas: For over twenty five years, Dr Shukla and his family distributes toys in Christmas to sick patients in Medical Center such as Flushing Hospital, Elmhurst Hospital, Woodhull Hospital and Children's Medical Center.



Toys Distribution with Hon. NYS Senator Stavisky



South Asians Visiting Preterm Babies: Hon. Congresswoman Meng, Hon. Senator Stavisky, Hon. Councilman Koo and Dr Shukla



Dr Shukla, Nursing Staff, Hon. City Controller Liu, Hon. NYS Senator Stavisky



South Asians Community, Hon. Councilman Koo, Santa, Hon. Senator Stavisky, Hon. Congresswoman Meng.



Pre-toys distribution conference: Hon. Senator Stavisky, Hon. Congresswoman Meng, Dr. Shukla Shukl, Others



Getting ready for toys distribution

Dr Shukla is founder Chairman of the board for NAVA (New American Voters Associations). The mission of NAVA includes 1) Educating new immigrant about election procedures and encouraged them to vote. 2) Women's empowerment, 3) Children's Education and 4) Liberty.



Hon. Congresswoman Clarks , Hon. Congresswoman Meng, Hon. Governor Hochul, Dr. Hari Shukla, Mrs. Kirti Shukla.



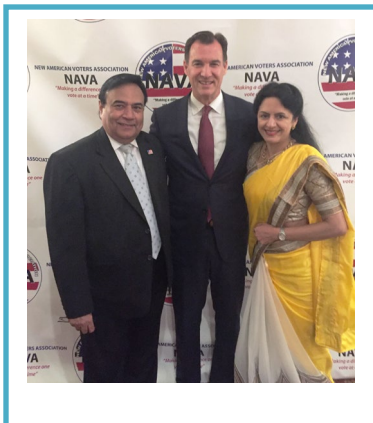
Dr Shukla addressing at Annual gala event.



South Asians community leaders with Dr Shukla



Back to School: School Bag distribution with Hon. Borough President Katz, Councilman Grodenchik



Hon. Congressman Tom Souzzi



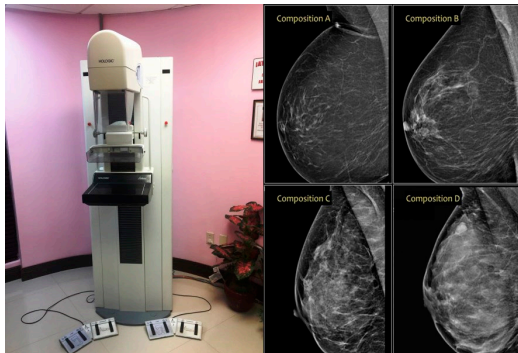
Brooklyn Borough President Hon. Adams



Hon. Congresswoman Clarks

Dr. Shukla is a founder and a president of South Asians of NY- a not for profit organization in NY. He does several activities through this organization such as:

- 1- Health education. 2- Promotion of cultural activities. 3- Integration of American and Indian culture.**
- 4- Celebration of American and Indian festivals. 5- Prevention of racial discrimination. 6- Teaching importance of voting.**



Dr Shukla & Mrs shukla were able to get grant of \$45k/year for five years for south asians women for free diagnosis.



Community issues discussing with, NY City Controller, NY City Councilman, NYS Senator



A sponsered program of Indian Music, NY



A Sponsered progrm of Indian traditional Dance, NY.



**South Asians Community celebrating July 4th:
Sikhs, Muslim, Hindus, Buddist and Jains .**



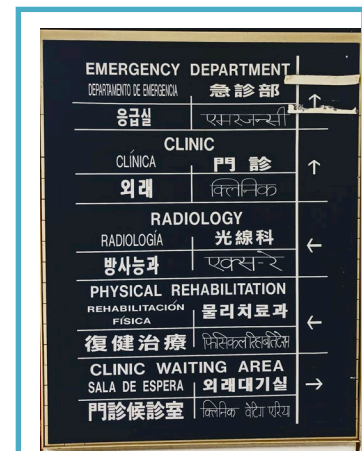
US born Children doing tradition Dance through sponsored program.

Dr. Shukla was instrumental for ethnic and religious accommodation for Southasians in hospital while he was president of Flushing Hospital Medical Staff Society.

- Dr Shukla introduced one vegetable and rice plate in the menu of inpatient hospital food menus, thereby accommodating vegetarian and vegan patients. The hospital hired a cook that can make vegetarian dishes. Now, a variety of foods are available for the diverse hospital population.
- Dr Shukla introduced the Gayatri Mantra photo in the hospital Chapel, to accommodate the Hindu population and Moon-star for to accommodate Muslim community. The Interfaith Chapel now accommodates several faiths including Christianity, Judaism, Hinduism, Islam and Buddhism.
- Dr Shukla requested the hospital to have all hospital signs in multiple languages to accommodate the diverse patient population. The hospital now displays signs in English, Spanish, Chinese, Korean and Hindi languages, which represents the multi-cultural borough population.
- Dr. Shukla was able to have Indian priest privileges in the hospital to serve sick Hindu patients and their relatives. Now the hospital provides religious services for Christians, Jews, Hindus and Buddhist patients.



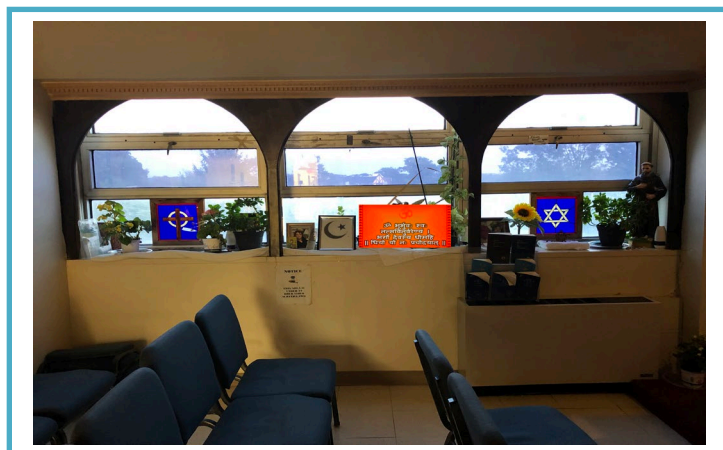
Flushing Hospital Medical Center



Hospital signs in several languages including Hindi



Current and former CEOs of Flushing Hospital Medical Center, Hon. Congressman Meeks and Dr Shukla



Interfaith Chapel in Hospital: Demonstrating support for Christianity, Judaism, Hinduism, and Islam.

Dr Shukla and His family Celebrates American and Indian festivals every year. Dr Shukla was first one to celebrate Diwali at Queens Borough hall. He celebrated Diwali at Gracey Mention with Mayors as well. Dr Shukla Celebrates Christmas with elected Officials and his patients. Dr Shukla Celebrateds Thanks giving at his office and with Vegan Vision every year.



Diwali with Hon. NY Governor Cathy Hochul.



Thanks Giving food distribution



Christmas Toys Distribution at Hospital with NYS Senator Stavisky and NYC Controller Lieu



Honoree at India Day Parade Manhattan and Long Island



With Borough president and Consul generals: India, Guyana & Mauritius



Mayor DeBlasio



Mayor Bloomberg



Borough president and Consul General of India

Holidays Celebration in New York with dignitaries

Dr Shukla organizes and sponsors few events each year that promotes cultural values and strengthens bond between people of several countries. Here are few events where South Asian Americans from India, Pakistan, Bangladesh and Sri Lanka participate.



Sponsors Indian Mela in New York for last six years



Marching Rath Yatra in New York with priests



Marching Janmastmy Parade New York



Dr. and Mrs Shukla at Ganesh Utsav in New York



Sponsors Indian folk dance



Sponsors Indian Dance Competition in New York.

ORGANIZING, SPONSORING & CELEBRATING INDIA'S INDEPENDENCE IN NEW YORK



India Independence Day



India Republic Day



Honoree at Parade



Manhattan Parade



Hon Governor and congresswoman



Honree at India day Parade



Hon. Mayor DeBlasio



Hon. Mayor Adams



Parading wit Congressman Souzzi



Gujarati Samaj Parade



Independence Day Celeration

ORGANISING AND SPONSORING INDIAN FESTIVALS IN NEW YORK



Lighting the Diya

Diya- Ho. Govn Hochul



Hon. Mayor Adams



Navratri Celebration



Indian Mela



Anna-Kut Darshan BAPS



Diwali at CGI-NY Office



Janmashtmi Parade



Jackson Heights Celebration



World Harmony Meeting



Ram Navmi Celebration



Mahatma Gandhi Jayanti



Holy Celebration with Mayor

Dr Shukla is involved in volunteer community work since medical school. Due to his affiliation with Rotary Club of Kankaria, Indian Red Cross society, St. John Ambulance and Civil Hospital-Ahmedabad, he was able to help Flood, Mud slide & Earthquake victims on emergency basis. On several occasion he stayed in affected areas for months.



Service to Flood victim children in India



Helping Flood Victim Pregnant lady



Running Clinic for Earthquake victims



In flood and Mud affected areas, elephant used as an ambulance – Indian Red Cross Society project. Dr. Shukla and his team.



Dr. Shukla received an honor from Governor of Gujarat Mr. K.K. Vishwanathan.



Dr Shukla received a citation from Governor Mukharjee and Mayor Joshi for his work in India.

Dr. Shukla has over eighteen thousand patients over thirty nine years in USA. Hundres of current patients have their parents as patients to Dr shukla when they were young. Over hundret of his patients are currently are doctors, dentist and lawyers in New Yor. His patients has severed on behalf of United States in Iraq and Afhaghanistan war.. Few dozen of patients serves as policeperson and figher fithgers in New York. He Loves sport. He presented his college team in Criket, used to boxing and participated in Marathon. He promotes game of Cricket, Tennis and Boxing.

He is married to Kirti for Forty plus years and they hace two sons Mrugank and Mehool, both are Radiologists and practicing in New York.



Cricketer Sachin Tendulkar



Cricketer Sir Vivian Richards



Accompanied Mr. Navik for super marathon Ahmedabad to New Delhi (1250 miles) finished in 31 days to promote health awareness.



Tennis stars Jimmy Connors and Tracy Austin



Hands in Hands for piece, hormony and non violence(Christian, Jews, Hindu, Sikhs, Jain at Dr Shukla's resident with Congresman Meeks.



L to R: Dr. Mrugank Shukla, Dr. Hari Shukla, Mrs. Kirti Shukla, Dr. Mehool Shukla

DR. SHUKLA PROMOTES INDIAN CULTURE, MUSIC AND SPORT OF CRICKET IN United states.



H.E. ACHARYA
MUKTAIVAN SWAMIJI



H.E. PRAMUKH SWAMI
MAHARAJ



H.E. ACHARYA
PURSHOTTAM SWAMIJI



H.E SWAMI RAM DEVJI



H.E. ACHARYA
LOKESH MUNI



SRI SRI RAVI SHANKAR



BHARAT RATNA SACHIN
TENDULKAR

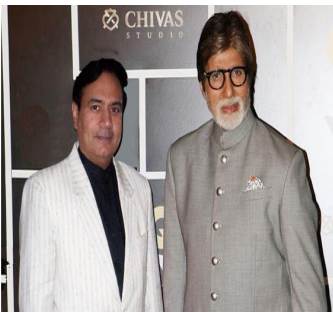


SIR VIVIAN RICHARDS



MR. BRIAN LARA

DR. SHUKLA PROMOTE INDIAN CULTURE, MUSIC AND SPORT OF CRICKET IN UNITED STATES.



Amitabh Bachchan



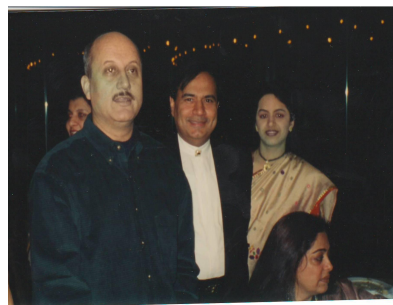
Dev Anand



Zeena Aman



Sameul Jackson



Anupam Kher



Shatrughan Sinha



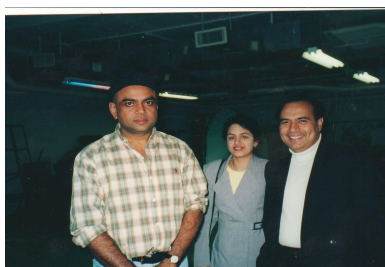
Kavitha Krishnamurthy



Nitin Mukesh



Udit Narayan



Paresh Raval



Poonam Dhillon



Mithun Chakraborty

DR. SHUKLA: PIONEER IN SURFACTANT THERAPY IN USA

- A) PRESIDENT KENEDY'S PRETERM INFANT
- B) SURFACTANT USE BY DR. SHUKLA
- C) NY GOVERNOR'S CITATION: Dr. Shukla A pioneer in United States.
- D) ORIGINAL RESEARCH ARTICLE OF DR. SHUKLA



PATRICK BOUVIER KENNEDY (AUGUST 7-9, 1963), THE CHILD OF PRESIDENT JOHN F. KENNEDY AND FIRST LADY JACQUELINE KENNEDY, WAS BORN PREMATURELY AT 34.5 WEEKS AND 2100 GRAMS.

HE HAD SURVIVED ONLY 39 HOURS AND 12 MINUTES AFTER BIRTH AT BOSTON CHILDREN'S HOSPITAL.

THREE MONTHS LATER PRESIDENT KENNEDY WAS ASSASSINATED.

- * THE SURFACTANT WAS FIRST USED IN PRETERM INFANTS IN JAPAN IN 1980.
- *THE FIRST SURFACTANT APPROVED FOR ROUTINE CLINICAL USE IN THE UNITED STATES WAS IN 1990.
- *FIRST CLINICAL TRIAL PUBLISHED 1991
- *DR SHUKLA USED SURFACTANT (SURVANTA) IN 1986



DR. HARI SHUKLA

First South
Asian to
Use
Surfactant

*THE SURFACTANT WAS FIRST USED IN PRETERM INFANTS IN JAPAN IN 1980.
*THE FIRST SURFACTANT APPROVED FOR ROUTINE CLINICAL USE IN THE UNITED STATES WAS IN 1990.

*FIRST CLINICAL TRIAL PUBLISHED 1991
*DR SHUKLA USED SURFACTANT (SURVANTA) IN 1987 & 1988 AS PHASE 2 TRIAL AND AS AN IND (INVESTIGATIONAL NEW DRUG) PROTOCOL OF FOOD AND DRUG ADMINISTRATION OF UNITED STATES

*DR. SHUKLA: PIONEER IN SURFACTANT ADMINISTRATION IN UNITED STATES. GOVERNOR CITATION.

- First Use of Surfactant in India – 2011
- Currently Surfactant used world wide for RDS.



State of New York

Executive Chamber

Citation

Whereas, New York State welcomes the opportunity to recognize individuals who, through their high standards of professional excellence, have served their fellow residents with distinction; it is therefore appropriate that we acknowledge Dr. Hari Krishna Shukla as he is awarded the Liberty Medal by the New York State Senate; and

Whereas, Dr. Shukla attended B.J. Medical College in India, where he specialized in the study of pediatric medicine, before coming to the United States through the Rotary International exchange program in 1980; he continued his education and training at numerous institutions in New York City, including Bellevue Hospital and Lincoln Hospital; and

Whereas, he has operated his own practice since 1985 in the Flushing neighborhood of Queens and is board certified in pediatrics, forensic medicine, and neonatal-perinatal medicine, with a focus on treating patients from the South Asian community; and

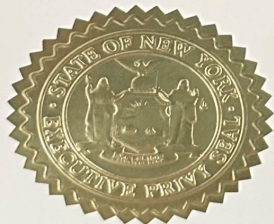
Whereas, Dr. Shukla's innovations in medical technology have saved countless lives across the globe; his mathematical formula to allow safe and accurate insertion of intravenous medications and fluids to premature infants improved the process by more than 25% compared to previous methods and has been utilized by doctors in teaching settings as well as 65% of hospitals in the United States; he also developed a formula for rapid estimation of insertional length of endo-tracheal tubes for infants and was the first physician in the United States to utilize surfactant to treat respiratory illness in premature infants; and

Whereas, in addition to his practice, Dr. Shukla dedicates his time to worthwhile endeavors; he holds teaching and leadership positions in numerous medical organizations, including Cornell Medical College, Northwell Health, and United States Citizenship and Immigration Services; he has utilized his skills to assist in humanitarian work such as disaster relief in the aftermath of the 2004 Indian Ocean earthquake and tsunami as well as the 2010 Haiti earthquake; and

Now, Therefore, I, Kathy Hochul, Governor of the State of New York, do hereby confer this Special Citation upon

DR. HARI SHUKLA

with gratitude and commendations for his commitment to the health and wellness of our residents.



Kathy Hochul

Governor
May 2024

Whereas, Dr. Shukla's innovations in medical technology have saved countless lives across the globe; his mathematical formula to allow safe and accurate insertion of intravenous medications and fluids to premature infants improved the process by more than 25% compared to previous methods and has been utilized by doctors in teaching settings as well as 65% of hospitals in the United States; he also developed a formula for rapid estimation of insertional length of endo-tracheal tubes for infants and was the first physician in the United States to utilize surfactant to treat respiratory illness in premature infants; and

United States Senate
Washington, D.C. 20510

The Honorable Charles E. Schumer

PROCLAMATION

Whereas: On the nineteenth day of June in the year two-thousand and twenty-five, Dr. Hari K. Shukla, MD, D. Ped, FAAP, FACFM, will be honored by the New American Voters Association for his extraordinary medical career and devotion to community; and

Whereas: Dr. Shukla is a triple board-certified physician with certifications in Neonatal Perinatal Medicine, and Forensic Medicine, and from the American Board of Pediatrics. His life's work has focused on caring for premature infants and children; and

Whereas: Dr. Shukla is a pioneer within his field. In 1998, he was the first physician in the United States to use surfactant in premature babies which is now the standard mode of therapy for preterm infants with premature lungs throughout the world. Additionally, he created procedures for umbilical catheter insertions in infants which has aided over 400 million sick children throughout the world. Dr. Shukla was also discovered proper estimation techniques for lengths of endo-tracheal tubes in infants. His discovery is now used in most hospitals throughout the country and is a required training for medical professionals in the United States; and

Whereas: The impact of Dr. Shukla's contributions to medicine cannot be overstated. His work has been recognized with prestigious awards including New York State's Liberty Award, a Lifetime Achievement Award awarded by President Biden, and the Pasteur Merieux and Connaught Award for his dedication to eradicating Polio throughout the world; and

Whereas: Beyond Dr. Shukla's extraordinary medical career, he has been a dedicated public servant through the New American Voters Association and South Asians of New York. Through these organizations, he has advocated for children's health, prevention of gun violence and drug addiction, and he has played a pivotal role in recovery efforts after natural disasters. His work in every aspect of his life has made an incredible difference in the medical field, his patient's lives, and children's health around the world; and therefore,

Be It Known: That I, Senator Charles E. Schumer, do hereby recognize and congratulate Dr. Hari K. Shukla for his remarkable efforts on behalf of the world's children and medicine. Our world is healthier because of his career. I know that he will continue these efforts for years to come.

Signed this 19th Day of June in the Year
Two Thousand and Twenty-Five

Charles Schumer

Charles E. Schumer
United States Senator



Rapid estimation of insertional length of endotracheal intubation in newborn infants

Hari Krishna Shukla, MD, Karen D. Hendricks-Munoz, MD, Yucel Atakent, MD, and Susana Rapaport, MD

Objective: To create a simple and accurate method of predicting the correct insertional length of endotracheal intubation during resuscitation of neonates.

Study Design: Phase I of the study enrolled infants that required either orotracheal or nasotracheal intubations. The endotracheal tube position was confirmed by auscultation and radiographic images. Three regression equations were then created using nasal-tragus length, sternal length, and birth weight on insertional length. In phase II of the study, the modified regression equations of nasotracheal and sternal length were used to predict endotracheal tube insertional length in 50 infants (40 orotracheal and 10 nasotracheal).

Results: Nasal-tragus length and sternal length are good parameters to estimate insertional length for endotracheal intubation ($p < 0.005$ for both the parameters). The modified prediction equation for insertional length of the endotracheal tube for the orotracheal route is NTL or $STL + 1$. For the nasotracheal route the equation is NTL or $STL + 2$.

Conclusion: During resuscitation of the neonate when vital parameters are difficult to obtain, the insertional length of endotracheal intubation can be quickly and accurately predicted by nasal-tragus length or sternal length. (*J Pediatr* 1997;131:561-4)

Endotracheal intubation is a common procedure required in neonates who are in need of respiratory assistance. Customarily, this procedure is accomplished in an emergency setting, where predicting data such as weight or length of the patient may not be easy. After intubation, it is a standard medical practice to confirm the position of the tip of the ET tube initially by chest auscultation and later by roentgenogram. However, after intubation, the incidence of malposition of the tip of the ET tube on radiographic examination can be as high as 50%.¹⁻³ ET tube malposition in the trachea is associated with increased morbidity, such as atelectasis, pneumothorax, poor ventilation, and acci-

dental extubation. Therefore satisfactory positioning of the tip of the ET tube on initial intubation is of prime importance. The purpose of this study was to create a practical mathematical model with good predictability that could be used in the emergency setting for estimation of ET tube insertional length.

METHODS

The study population included sick newborn infants born at New York University Medical Center, Bellevue Hospital, and Flushing Hospital Medical

Center that required intubation. During phase I of the study, 66 infants were intubated by the oral route and 18 infants were intubated by the nasal route. The ET tubes used in the study were calibrated at each centimeter distance (Concord/Portex, Keene, N.H.). The following parameters were measured on each patient: (1) nasal-tragus length, defined as the measurement from the base of the nasal septum to the tip of the tragus of the ear on either side; (2) sternal length,

BW	Birth weight
ET	Endotracheal
NTL	Nasal-tragus length
STL	Sternal length

defined as the measurement from the suprasternal notch to the tip of xiphoid process of the sternum; and (3) birth weight measured in grams. The position of the tip of the ET tube was determined clinically by listening for an equal air entry bilaterally in the lungs and confirmed by the radiographic examination. The tip of the ET tube was considered satisfactory when it was at equal distance from the carina and the imaginary line joining the medial ends of the clavicles. Once the tip of the ET tube was found satisfactory, the marking (in centimeters) visible at the angle of the mouth or at the nostril was noted and was considered as the insertional length of the ET tube. With this information, three regression equations of insertional length on each body parameter (NTL , STL , and BW) were created.

During phase II of the study, the original regression was slightly modified for easy calculation. These modified regression equations using NTL , STL , or both were applied prospectively in 40 infants (25 NTL and 15 STL) for the oral route

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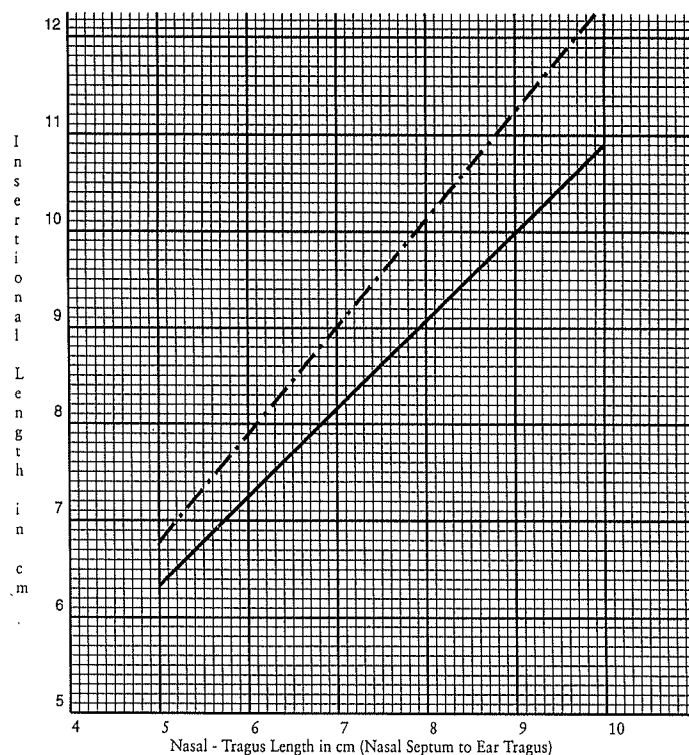


Fig. 1. Insertional length of endotracheal intubation by NTL. Solid line, Orotracheal route (Actual $Y = 0.91X + 1.8$, shown in graph; Modified $Y = NTL + 1$). Dashed line, Nasotracheal route (Actual $Y = 1.1X + 1.3$, shown in graph; Modified $Y = NTL + 2$). Graph shows actual regression lines.

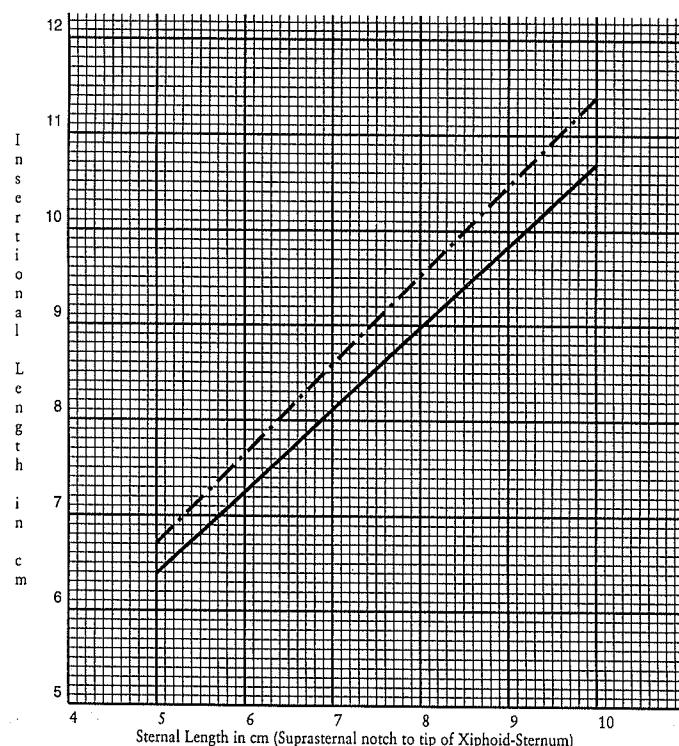


Fig. 2. Insertional length of endotracheal intubation by STL. Solid line, Orotracheal route (Actual $Y = 0.86X + 1.9$, shown in graph; Modified $Y = STL + 1$). Dashed line, Nasotracheal route (Actual $Y = 0.86X + 1.9$, shown in graph; Modified $Y = STL + 2$). Graph shows actual regression lines.

and in 10 infants for nasal route (5 NTL and 5 STL) to validate their accuracy.

Statistical Analysis

Statistically, mean and standard deviations were calculated when indicated. Least square regression equations were created for insertional lengths on NTL, STL, and BW. Student's t test was used to assess each coefficient of correlation.⁴ A p value of less than 0.05 was considered significant.

RESULTS

During phase I of the study, 66 infants required orotracheal intubation: 35 females and 31 males with a gestational age of 31.1 ± 4.7 weeks (mean ± 1 SD), with a range of 23 to 42 weeks. Their BWs were 1610 ± 840 gm (mean ± 1 SD), with a range of 550 to 4500 gm. In the nasotracheal group there were 18 infants (10 females and 8 males) with gestational ages of 32.4 ± 4.1 weeks (mean ± 1 SD) and a range of 28 to 40 weeks. Their weights were 1870 ± 1100 gm (mean ± 1 SD), with a range of 837 to 3900 gm. Listed in the Table are the coefficients of correlation of orotracheal and nasotracheal insertional length on the three body parameters. All coefficients of correlation are statistically significant ($p < 0.005$). This table also shows actual and modified regression equations. The modified regression formulas are given for easy calculations in emergency settings.

Fig. 1 shows the estimation of orotracheal and nasotracheal length from NTL using the actual regression line. The modified equation is mentioned for emergency use. Fig. 2 shows the actual regression line to predict orotracheal and nasotracheal insertional length from STL. The mnemonic equation for emergency use is also provided.

Fig. 3 compares the actual and the modified regression lines for the prediction of orotracheal length. The variability between the lines were not clinically significant ($p > 1$).⁴ At the extremes of the graph, the modified line can be off by only 0.3 cm. This is acceptable in clinical situations because it falls well within 1 SD. Likewise, actual and modified equation lines for nasotracheal insertion were com-

pared. These lines were statistically not significant ($p > 1$).

Prospectively, 38 of 40 infants who had orotracheal intubation using the modified predictor had perfect ET tube position. Two infants required minimal adjustment (one tube pulled and other tube was inserted by 0.5 cm). None of the infants in the prospective group had any complications from the procedure. All 10 infants with nasotracheal route intubation had acceptable position of the tip of ET tube.

DISCUSSION AND CONCLUSION

This study demonstrates that NTL and STL can be used swiftly and accurately to calculate ET tube insertional length for neonates using the mnemonics. Both the actual and the modified equations can be used to predict ET insertional lengths. NTL and STL are easily and correctly calculated either by measurement tape or by placing the ET tube directly on the respective body part (NTL or STL). Adding 1 or 2 cm to this measurement gives the respective ET tube insertional length for either orotracheal or nasotracheal intubation. With this method one can predict insertional length in about 10 seconds. In emergency situations use of the modified mnemonic is more practical. In other situations, use of the graph is advised. As always, radiographic confirmation is recommended.

We preferred to use NTL compared with STL. In rare cases calculating STL may interfere with auscultation of the heart. We also observed that occasionally the resuscitator may find it difficult to measure STL in an infant with severe chest retractions. However, in the child with facial deformity (cleft lip/palate or ear deformity) the STL may be more desirable. Alternately, using both parameters simultaneously and taking the mean of the predicted values gives a better prediction, at least theoretically.

During the course of the study, we found that BW continued to be a good predictor for ET tube insertional length as described previously for orotracheal intubation⁵ and nasotracheal intubation.⁶ Our study is unique compared with previous

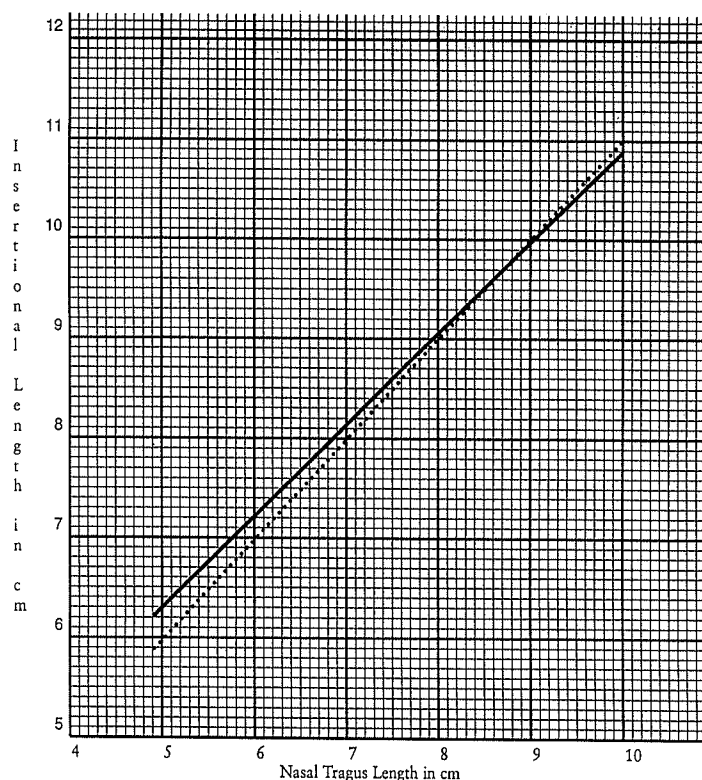


Fig. 3. Comparison of actual and modified regression lines for orotracheal intubation where "X" is NTL. Solid line, actual $Y = 0.91X + 1.8$; dotted line, modified $Y = NTL + 1$.

Table. Coefficients of correlation of insertional length of ET tube on three independent variables and the actual and modified regression equations for estimation of insertional length for oral and nasotracheal intubation

	Variables		
	NTL	STL	BW
Orotacheal insertion			
Coefficients of correlation (r)	0.97*	0.95*	0.95*
Actual regression equation	$0.91x + 1.8$	$0.86x + 2.1$	$1.1x + 6.1$
Modified regression equation	NTL + 1 cm	STL + 1 cm	BW + 6 cm
Nasotracheal insertion			
Coefficients of correlation (r)	0.96*	0.93*	0.94*
Actual regression equation	$1.1x + 1.3$	$0.95x + 1.9$	$1.4x + 6.2$
Modified regression equation	NTL + 2 cm	STL + 2 cm	BW + 7 cm

NTL, Nasal-tragus length in cm; STL, sternal length in cm; BW, birth weight in kg.

*All with p value <0.005 .

studies^{5,6} in having more smaller babies and providing graphs for both orotracheal and nasotracheal intubation.

The Table provides actual and modified regression equations using BW as a predictor. However, in emergency situations accurate weight may not be available.

Furthermore, residents in training may find it difficult to guess BW in the emergency setting. Therefore our body parameters (NTL and STL) are most useful in these settings. For infants requiring ventilation we suggest that NTL or STL are measured and recorded in the ID cards

that are displayed on the crib/warmer. Even in a stable intubated baby knowledge of NTL or STL can help in deciding whether the ET tube is pulled or pushed accidentally. Our resident staff prefer orotracheal intubation over nasotracheal intubation in emergency situations. However, preference for oral or nasal intubation may vary from clinician to clinician, primarily as a result of institutional training as a resident or a fellow. Therefore our graphs provide predicting lines for both the methods. Use of this method will provide reliable and rapid estimation

of ET tube insertional length even in the worst clinical scenario.

We sincerely thank Mrugank Shukla of Cardezo High School, Bayside, for his typing and art work.

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* DR. SHUKLA'S RESEARCH ON UMBILICAL CATHETER USED WORLD WIDE.

* IT IS ESTIMATED THAT 400 MILLION INFANTS CATHETERIZED WORLDWIDE USING DR. SHUKLA'S FORMULA

- A) SLIDES SHOWING UMBILICAL CATHETER INSERTION.
- B) WORLDWIDE LIST OF UNIVERSITIES AND HOSPITALS USING DR. SHUKLA'S FORMULA.
- C) ORIGINAL ARTICLE OF DR. SHUKLA ON UMBILICAL CATHETERS.

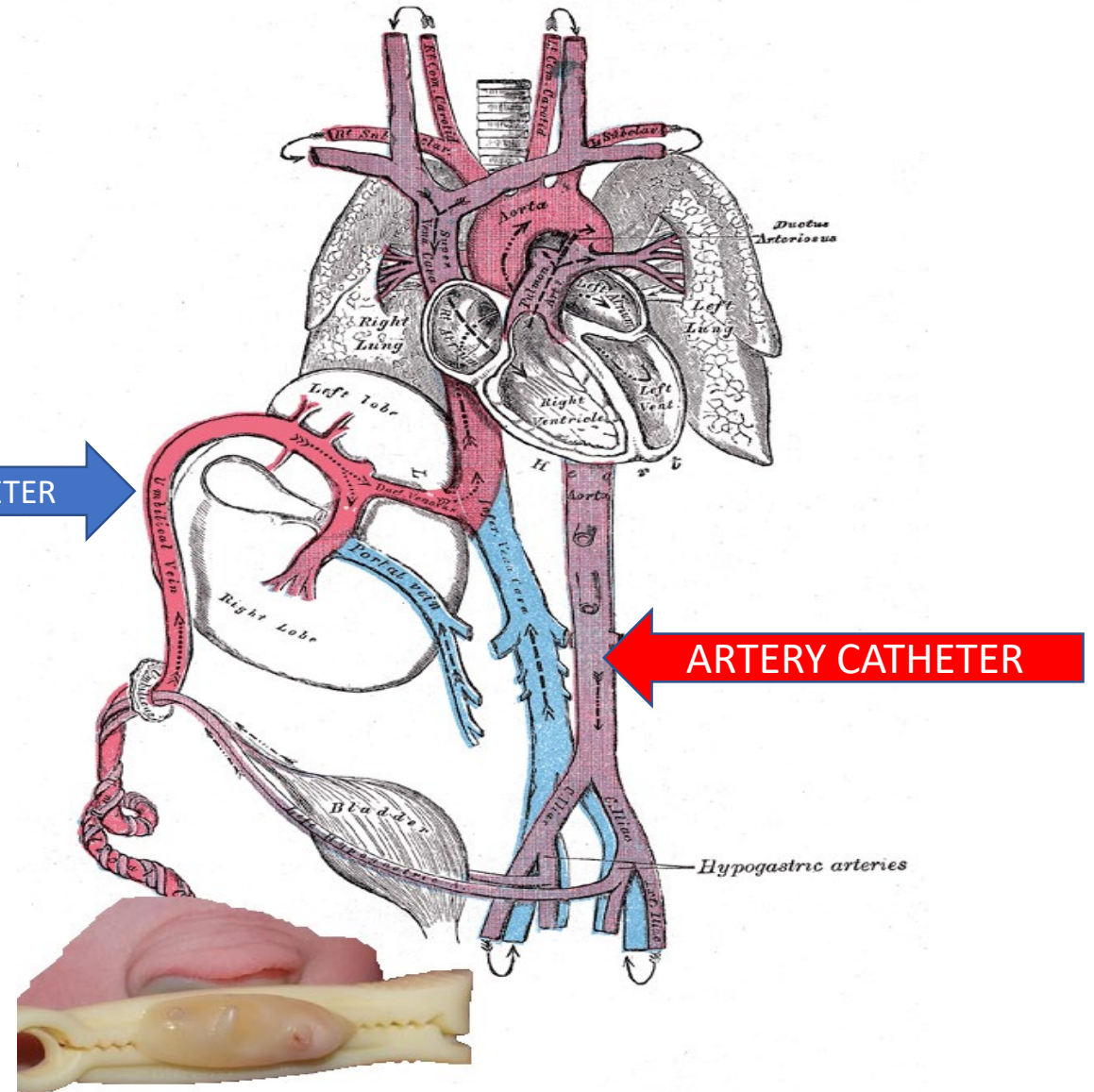


NEWBORN AFTER DELIVERY



UMBILICAL CORD IN 3.5 KG BABY

VENOUS CATHETER



COURSE OF UMBILICAL CATHETERS



PRETERM INFANT BW 610 GRAMS
AFTER DR. SHUKLA INSERTED
UMBILICAL CATHETERS

DR. SHUKLA WITH SAME
INFANT AFTER SURFACTANT
THERAPY AND UMBILICAL
CATHETERS.



Rapid Estimation of Insertional Length of Umbilical Catheters in Newborns

Harikrishna Shukla, MD, D Ped, Angelo Ferrara, MD, PhD

• To determine the neonatal body measurement that best predicts insertional umbilical catheter lengths, we studied two commonly used parameters—shoulder-to-umbilicus length and total body length—and two new parameters—suprasternal notch–pubic symphysis length and birth weight (BW)—on 43 umbilical artery (UA) and ten umbilical vein (UV) catheterizations. The new parameters showed better correlations than the currently used ones. The BW variable, with the highest coefficient of correlation among all four parameters, was applied prospectively in 25 UA and 16 UV catheter insertions. All catheter tips thus placed were found to be in acceptable positions. Although any one of the four parameters can be used clinically, we prefer the BW parameter for its reliability, reproducibility, and ability to be estimated in emergency settings. The modified regression (estimating) equations utilizing BW are as follows: UA catheter length = $3 \cdot BW + 9$; UV catheter length = $\frac{1}{2} \cdot UA$ line calculation + 1, in which lengths are measured in centimeters and BW is measured in kilograms. (AJDC 1986;140:786-788)

Umbilical vessel (arterial and venous) catheterization is a common procedure used to monitor and stabilize sick newborns. The umbilical artery (UA) has been used principally to monitor blood gases and blood pressure. Some neonatal centers have also used the UA route for the administration of antimicrobial agents, fluids, and total parenteral nutrition. On the other hand, the umbilical vein (UV) has mainly been used for transfusions and monitoring central venous pressure.

There has been a variety of indexes used to determine the insertional length of the catheter. At the present time, shoulder-to-umbilicus length (SUL) or total body length (TBL) are the measurements most used. Usually these procedures are done in emergency settings where it may be difficult to obtain an accurate measurement of these parameters because of increased flexor tone of the newborn and multiple monitor attachments to the body. These measurements must also be interpreted with graphs that may not be readily available.

METHODS

The study population included sick newborns admitted to the neonatal intensive care unit at New York University and Bellevue Medical Centers, New York, during 1983 and 1984. The retrospective part of the study was performed on sick newborns in whom at least one umbilical vessel had been catheterized. Standard polyvinyl Argyle catheters with a premeasured total length of 40 cm (± 1 cm) (and sizes 3.5 F or 5.0 F) were inserted by house officers using a standard procedure.¹ Insertional length was determined from Dunn's² graph based on SUL. For the UA portion of the study, only those patients with UA catheter tips between T-6 and T-10 vertebrae were included in the study. The study population consisted of 43 patients (mean [± 1 SD] birth weight, 2037 [± 1077] g), including six small-for-gestational-age (SGA) and four large-for-gestational-age (LGA) newborns. The SUL and TBL were measured twice on each patient, as described by Dunn.² The distance between the suprasternal notch and superior border of pubic symphysis (SSL) was also measured twice. The coefficients of variation between the two measurements for all variables were less than 5%. The external catheter length was measured from the anterior abdominal wall to the external end of the catheter. The internal catheter length was calculated by sub-

tracting the external catheter length from the premeasured total catheter length. Birth weight (BW) was measured once, and four linear regression equations of internal catheter length on each body measurement were then created.

A similar study was undertaken for the UV catheters. Ten patients (mean birth weight, 2260 \pm 1144 g), including one SGA and one LGA patient, were studied. Each patient had the UV catheter in an acceptable position, ie, the catheter tip was lying just above the diaphragm in the inferior vena cava or right atrium (confirmed by roentgenogram, central venous pressure, and blood gas analysis).

In the prospective aspect of the study during the period of January 1984 to June 1984, 25 UA catheters and 16 UV catheters in 29 patients (including two SGA and one LGA patients) were inserted using the regression equation involving BW derived from the retrospective study, as shown in the Figure.

Statistically, means and SDs were calculated where indicated. Least square regression equations were created for insertional lengths on each of the body measurements. The Student *t* test was used to assess each coefficient of correlation. The Hotelling test was used to compare the difference of any pair of nonindependent coefficients of correlation.³ A *P* value of less than .05 was considered significant.

RESULTS

Listed in the Table are the coefficients of correlation (*r*'s) created from the four anatomic points of reference. All the *r*'s are statistically significant (*P* < .001). In applying Hotelling's formula³ for two nonindependent *r*'s for UA catheters, it was noted that BW as a variable statistically explains more of the variance of the predicted internal length when compared with SUL (*P* < .005). Similarly, the TBL and SSL had significantly improved *r*'s when compared with SUL (*P* < .05 and *P* < .025, respectively). There was no

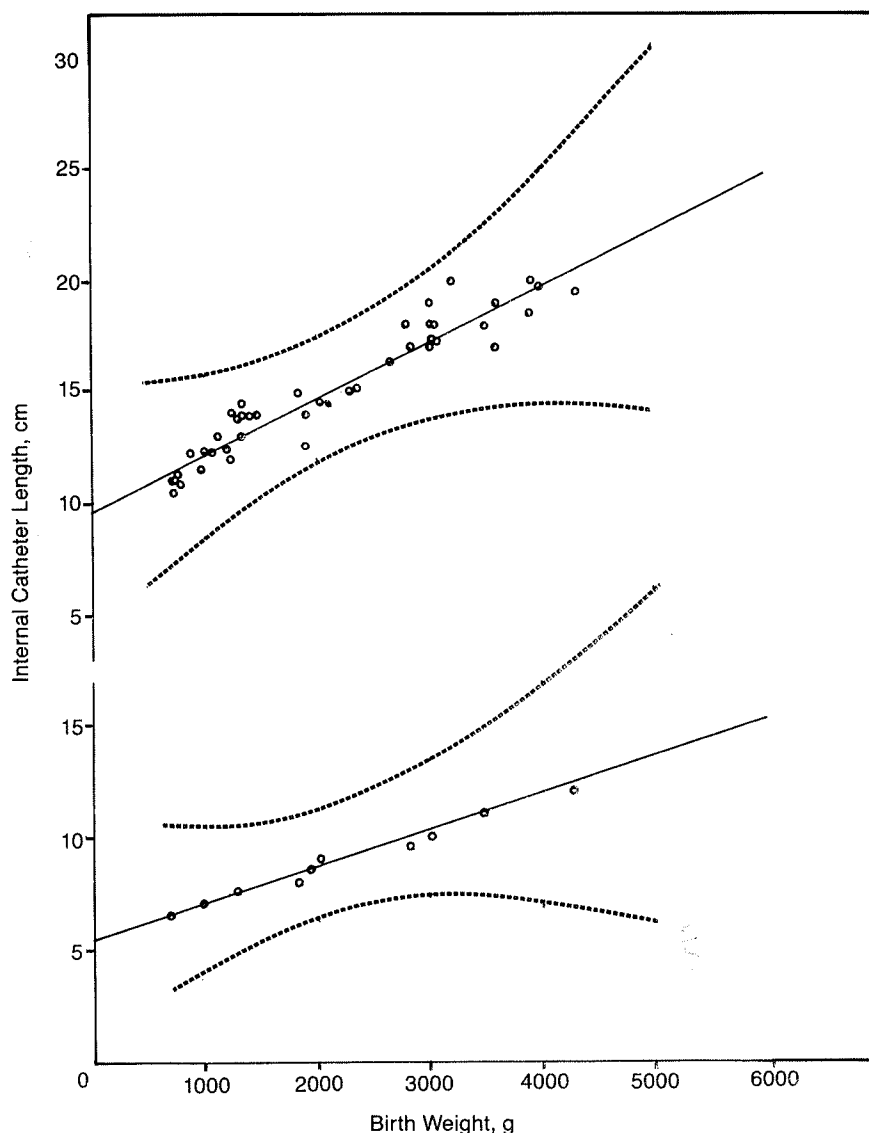
Accepted for publication April 19, 1986.
From the Department of Pediatrics, New York University School of Medicine, New York.
Reprint requests to Department of Pediatrics, New York University School of Medicine, 550 First Ave, New York, NY 10016 (Dr Ferrara).

significant difference among r 's of BW, TBL, and SSL. Pertinent to the UV catheters, no such difference was found between any two r 's. Listed also in the Table are modified formulas derived from the original regression equation for each independent variable for rapid estimation of insertional length of umbilical catheters (UA and UV) in emergency settings. Estimates from these mnemonics were not significantly different from those of original regression equations.

Prospectively, using either the exact BW regression equations (Figure) or the modified BW regression equation (Table), 26 UA and 16 UV catheters were inserted. All catheter tips were found to be in acceptable positions as described earlier. There was no significant difference between the BW of the retrospective group and that of the prospective group (UA F test: 1, 66 = 2.06 [$P > .05$]; UV F test: 1, 24 = 0.596 [$P > .25$]).

COMMENT

In 1966, Dunn² first attempted to provide guidelines for the length of umbilical catheter placements. Specifically, he studied 50 newborns who had died during the perinatal period. Their weights ranged from 600 to 4027 g. A catheter was placed in each UA and UV, and then several measurements were carried out to define anatomic sites to correlate with the insertional length. It was clear from Dunn's study that both TBL and SUL showed definite relationships with internal catheter lengths. However, Dunn did not attempt to create any regression equations to describe the explicit mathematical relationships. Two years later, in 1968, Gupta et al⁴ discussed the technique of UA catheterization, together with the incidence of complications. The authors' aim was to reach the diaphragm with the UA catheter, and this distance was estimated using a table (from 8 to 10 cm for an infant weighing 1000 g to 14 to 15 cm for an infant weighing 2500 g). No information was provided as to the derivation of the table or the accuracy of the estimate. Egan and Eitzman,⁵ in 1971, reviewed the indications and complications in 259 UA catheterizations. The



Estimates of insertional length of umbilical catheters (umbilical artery catheter tip inserted between T-6 and T-10; umbilical vein catheter tip inserted above diaphragm in inferior vena cava near or in right atrium) based on birth weight (BW) (with 95% confidence intervals). Modified estimating equations utilizing BW are as follows: umbilical artery length = $2.5 \cdot BW + 9.7$ (top graph) and umbilical vein length = $1.5 \cdot BW + 5.6$ (bottom graph), where BW is measured in kilograms and lengths in centimeters.

investigators gave no guidelines for estimating the internal lengths for catheters. These authors stated that the catheter was arbitrarily inserted to a distance of 15 to 20 cm and that the catheter tips were observed by roentgenography. With this method the catheter tips appeared in the carotid artery in many cases. Weaver and Ahlgren⁶ applied a more systematic approach in determining the internal catheter length. They stated that 0.33 times the crown-heel length predicted the required internal catheter length

to place the tip between T-6 and T-10; however, no supporting data were presented. In 1980, Rosenfeld et al⁷ studied the relationship of catheter length to TBL and SUL and then compared their results with the predictive length of Dunn's² classic work of 1966. The approach of Rosenfeld et al⁷ seemed to give a better prediction for catheter placement at T-8. Correspondence between Pollack and Roloff⁸ and Phelps⁹ argued the relative merits of SUL and TBL as predictors for internal catheter length.

Coefficients of Correlation of Internal Catheter Length on Four Independent Variables and Respective Modified Regression Equations for Rapid Estimation of Insertional Lengths*				
	Variables†			
	SUL	TBL	SSL	BW
Umbilical artery line				
Correlation coefficient (r)	.900	.942	.949	.953
Modified regression equation	SUL + 2	1/3 TBL	SSL	3BW + 9
Umbilical vein line				
Correlation coefficient (r)	.940	.950	.970	.970
Modified regression equation	1/2 of UA line calculation + 1 cm			

*When estimating lengths, the umbilical stump length needs to be considered.

†SUL indicates shoulder-to-umbilicus length; TBL, total body length; and SSL, suprasternal notch–pubic symphysis length (all measurements in centimeters). BW indicates birth weight (measured in kilograms).

Our study does not address the controversy of high (T-6–T-10) vs low (L-3–L-4) placement. In the mid-1970s, Mokrohisky et al¹⁰ suggested that low UA placements were related to an increased incidence of complications such as blanching, limb pallor, or embolic phenomena. Other authors¹¹ suggested that low-placement aortic lines (L-3–L-4) are just as safe as high-placement lines. Still others¹² believe that complications can occur with either low or high placement. Based on the experience in neonatal intensive care units in New York medical centers and elsewhere,¹⁰⁻¹³ and because of difficulties in exactly placing and/or fixing the UA line at the level of L-3–L-4, we have elected to consider the thoracic aortic placement (T-6–T-10) more practical, safe, and feasible.

The BW variable shows a better correlation with insertional length of umbilical catheters when compared

with the currently used SUL and TBL methods. A question concerning the appropriateness of the BW regression formula for SGA and LGA newborns should be raised. Since the number of such patients in this study is relatively small, only speculation about the potential measuring problem in this population can be suggested. Two comments can be made:

1. Since SGA and LGA newborns would require relatively less and more insertional catheter lengths, respectively, the BW regression formula would, in our experience, compensate for the distance needed in these patients.

2. In the placing of UA (T-6–T-10) and UV (diaphragm to right atrium) catheters, a relatively safe margin (2 to 4 cm) could be expected. Any potential distortion of insertional lengths estimated for SGA and LGA newborns would most likely be in the safe range

of margins. Of course, a larger population of SGA and LGA patients would be necessary to corroborate these conjectures.

In short, the BW factor appears to be more reliable and reproducible, and it can be readily estimated in emergency settings. We therefore prefer the BW variable for a rapid estimation of insertional length of umbilical catheters.

The authors sincerely appreciate the critical review of this manuscript by Joseph Dancis, MD.

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4. USA- AMERICAN ACADEMY OF PEDIATRICS
5. USA - JOHN HOPKINS - PEDATRIC RESIDENT MANUAL
6. USA - NYU NICU PROTOCOL
7. USA - NIH - NATIONAL LIBRARY
8. USA - AMERICAN HEART ASSOCIATION MEDSCAPE
9. USA -UNITED STATES GOVERNMENT - NIH.
10. UNITED KINGDOM - OXFORD UNIVERSITY - PEDIATRIC HAND BOOK RANKED # 1 IN UK
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28. JAPAN - MOST COMMON METHOD FOR UMBILICAL CATHETER
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