Screening for pressure: the Berens-Tolman tonometer

In April 1950 Conrad Berens MD and Charles Tolman BS, a consulting engineer, announced in the Journal of the American Medical Association an instrument called ‘Ocular Hypertension Indicator (Tonometer)’. The instrument was designed to allow general practitioners to screen eyes for the presence of pressure elevated above the normal. This would allow them to refer for further investigation and possible treatment those individuals who demonstrated a value above normal, which was set at 25 mm of mercury and thus prevent many eyes from going blind.

The instrument is depicted on the cover of this issue of the BJO. The foot plate of the instrument was constructed to correspond with the popular Schiotz tonometer introduced 45 years previously. There was a free moving central plunger with two closely spaced lines engraved around its top. The top of a hexagonal holding piece had a plastic moulded prism with a broken line engraved on it. When the line on the free moving plunger was on the same level as that on the prism the patient’s intraocular pressure would be 25 mm of mercury. The thickness between the engraved lines on the plunger represented 3 mm of mercury allowing a measure of the pressure for example; two thicknesses above the line engraved on the prism would indicate an intraocular pressure of 31 mm of mercury.

The plastic moulded prism was designed in such a way that the alignment of the engraved lines could be seen from the side or from above (figure 1).

The instrument was made by the O Gulden Company of Philadelphia but attracted a lot of attention due to the status and reputation of its inventor Conrad Berens (1889–1963, figure 2). Berens was a very talented sportsman with skills in tennis, swimming, golf and yachting. However, it was as a clinician, author, organiser and teacher of ophthalmology that he excelled. He was to become one of the most prominent ophthalmologists of his generation in the USA. He was the son of an ophthalmologist also called Conrad Berens who practiced in Philadelphia.

Berens graduated in medicine in 1911 from the University of Pennsylvania. In 1913 he became a house-surgeon in ophthalmology at the New York Eye and Ear Infirmary and remained connected to this institute for the rest of his life. He established a research department in the Infirmary which was named after him. This became one of the most progressive departments in New York innovating general medical surveys, pre-operative bacteriological tests and the use of sterile gloves and sutures for wound closure. The first course in orthoptic training also started here. During this time he served as consultant to ten other hospitals in the New York area.

Berens was also well known for his work in the armed services. In World War I, he saw service in France in the Medical Corps. He founded the School of Aviation Medicine of the US army (previously the Research Laboratory for Aviation). In World War II he was national civilian consultant to the Air Force Surgeon and later the Surgeon General of the US Air Force.

Berens accomplishments and contributions did not end with those described above. He was a prolific writer and an organiser of societies for ophthalmology. The book entitled The Eye and its Diseases, which he edited, was published in 1936 was a compilation of specialist chapters from eighty of the world’s renowned international ophthalmologists, including from the UK. He organised the establishment of the Association for Research in Ophthalmology. He co-founded the Pan-American Association of Ophthalmology. With Dr Daniel Kirby he set up the first graduate course in ophthalmology at the New York University Bellevue Medical School.

He became Chairman of the Council for Research in Glaucoma and chairman and president of numerous other boards and councils.

Richard Keeler, Arun D Singh, Harminder S Dua

Competing interests None.
Provenance and peer review Commissioned; internally peer reviewed.
Screening for pressure: the Berens-Tolman tonometer

Richard Keeler, Arun D Singh and Harminder S Dua

Br J Ophthalmol 2013 97: 954
doi: 10.1136/bjophthalmol-2013-303880

Updated information and services can be found at:
http://bjo.bmj.com/content/97/8/954

These include:

Email alerting service
Receive free email alerts when new articles cite this article. Sign up in the box at the top right corner of the online article.

Notes

To request permissions go to:
http://group.bmj.com/group/rights-licensing/permissions

To order reprints go to:
http://journals.bmj.com/cgi/reprintform

To subscribe to BMJ go to:
http://group.bmj.com/subscribe/