

## THE CURRENT STATUS OF LIP PRINTS AND THEIR USE FOR IDENTIFICATION

*J. Ball*

*Centre for Forensic Science University of Western Australia*

### ABSTRACT

The use of lip prints for human identification was first suggested in 1950 and research was carried out on lip prints in the 1960s and early 1970s, resuming in the last few years. Although lip print identification has been utilized in court in isolated cases more research needs to be conducted in this field with regard to confirmation of uniqueness, and the collection and interpretation of evidence. Lip print identification needs to be acceptable in court as scientifically evidence based. **J Forensic Odontostomatol 2002;20:43-6)**

**Key Words:** Lip prints, identification, research, court

### INTRODUCTION

The idea of using lip prints for identification was first suggested by Le Moyne Snyder in 1950 in his book *Homicide Investigation*.<sup>1</sup> A review of the literature indicates that from the 1960s through until 1975 some research was conducted on the use of lip prints as a source of human identification.<sup>2,3,4</sup> This article looks at the history of lip prints, where and how this evidence has been used in the courts and where it stands as a source of forensic evidence today.

### REVIEW

#### **History of lip prints as a means of identification**

In the mid 1960s Santos<sup>2</sup> in Brazil and Suzuki<sup>3</sup> in Japan were investigating the use of lip prints as a source of human identification. Santos suggested that the wrinkles and grooves found on the lips could be divided into simple and compound types, which could be further divided into eight other types.

Suzuki in a study investigating lipstick, found that none of his participants had the same lip groove pattern. Following this discovery Suzuki carried out more investigations, collecting lip prints and using methods similar to finger print recording, from a number of individuals, both male and female over a range of ages, and including a group of twins. Any

lips which showed any inflammation, injury, cicatrization, or deformity were excluded; these abnormalities are however personal identification markers in themselves. He divided the lips into four quadrants and devised his own classification of six different types of grooves. As the pattern of grooves on the lip varies, one lip can be allocated several types and each quadrant was allocated two different groove types. He demonstrated that no two lip prints manifested the same pattern, that lip prints of twins although very similar were not identical and that lip print characteristics may be inherited from either parent.

In 1974 Tsuchihashi,<sup>4</sup> who had earlier worked with Suzuki, carried out another study. His study included a greater number of participants as well as family groups and his results were similar to Suzuki's. By comparing the lip prints of the twins with their parents he found that they closely resembled one parent which adds strength to the theory of the heredity of lip prints. This study was a longitudinal one recording monthly lip prints over a three-year period of some participants and finding that their lip prints did not change. He also found that following trauma to a lip it resumed its groove pattern after healing.

Following this research in the 1970s, identification using lip prints appears to have been taught to police officers in the United States of America. James Cron, who was a lieutenant with the Dallas Sheriff's department taught lip print identification in the 1980s and 1990s in Texas<sup>5</sup> and the FBI Latent Fingerprint Section in Washington D.C. currently conducts Lip Print Workshops.<sup>6</sup> A school in the United States of America includes some activities on lip print identification in its science program.<sup>7</sup>

### **Current research**

A review of the literature comes up with very little on research into lip prints from the mid-1970s until 2000 where some research has been carried out by a group in Spain.<sup>8</sup> Lipstick smears are often left as trace evidence and can link a suspect to a crime scene. In recent years however the cosmetic industry has been developing lipsticks which do not leave a visible smear or mark in contact and have been called persistent lipsticks. This Spanish group has looked into the latent lip prints left behind by these new lipsticks and their possible use as forensic evidence. After applying the persistent lipsticks, lip prints were made on a variety of materials and were developed after intervals ranging from two hours to thirty hours following impression, using a variety of techniques similar to those used in lifting fingerprints. They found that different developers performed better than others and that no lip prints could be developed on fabric using any developer. They suggested that with the introduction of new smearless or markless lipsticks the possibility of latent lip prints should be considered.<sup>8</sup>

The results of this study with regard to latent lip prints is interesting. Fingerprints are developed by a number of methods which rely on the fact that sweat and body oils which have been transferred from the body to an object react with a number of reagents to become visible. Fingerprint powders adhere to sweat and body oils, iodine when heated reacts with sweat, ninhydrin reacts with the amino acids in sweat, heated cyanoacrylate (Super Glue) reveals latent prints, and sweat will fluoresce when illuminated by a laser. The vermilion borders of the lips have minor salivary glands and sebaceous glands, the latter being principally present around the edges of the lip associated with hair follicles, with sweat glands in

between, and secreting oils. Moving from the lip to the alveolar mucosa, crossing the transitional zone, there are occasional sebaceous glands and the lip is also subject to drying, requiring moisturising by the tongue. With these secretions and continual moisturising therefore it would be logical to think that latent lip prints would be available at all crime scenes if they were looked for. Items which may have lip prints, such as glass, could be tested for latent prints using some of the above methods.

Discussions with members of the Finger Print Division of the Western Australia Police Force have confirmed this. Williams<sup>9</sup> also stated that lip prints could be recorded without the use of lipstick or other recording medium provided a suitable (non-porous) surface had been used which was then developed for prints.

### **Recording lip prints**

Lip prints can be recorded in a number of ways. On a non-porous flat surface such as a mirror they can be photographed, enlarged and overlay tracings made of the grooves. They can be photographed directly with no medium and tracings made but this requires correct lighting.<sup>9</sup> Rouge can be applied to the lips and then the lips are photographed<sup>4</sup> while Williams<sup>9</sup> suggests that after lipstick is applied to the lip multiple records or readings should be taken until all the transfer medium is exhausted. This technique would be the same as collecting finger prints by pressing inked fingers on to special paper, which was used early on, and the images then observed through a magnifying glass and traced onto cellophane.<sup>4</sup> Provided the lip print is left on a suitable medium it can be developed using a number of different powders<sup>8</sup> or cyanoacrylate and photographed. The powders used are the same as for fingerprint development and the latent lip prints must be dry.

### **Problems with lip prints**

The lip crease pattern is on the vermilion border of the lip, which is quite mobile and lip prints may vary in appearance according to the pressure, direction and method used in making the print. If lipstick is used as a recording medium the amount applied may also affect the print.<sup>4</sup> To overcome this, several sets of prints should be taken until all the recording medium has been exhausted and lip prints are then evaluated

on a pattern comparison between a known and unknown lip print. The print is traced manually which presents problems with reproduction and introduces some subjectivity to the comparison.

Unfortunately, over the years, lip prints have been lumped together with other identification methods that have not gained a large following. These include examining fingernail striations, palm and elbow creases and eye retina patterns. Individualisation of animals by examining stripes on tigers and zebras has also been attempted.<sup>10</sup>

### **Lip prints in court**

Since 1923 admissibility of evidence in court in the United States of America has been based on the Frye test which assumed a general acceptance of the presented evidence by the relevant scientific community. In recent decades the Frye test has been rejected in favour of the Federal Rules of Evidence, which provides for all evidence to be admissible and general acceptance of the evidence as not necessary.

The actual use of lip prints in court is rare and its acceptance debatable. Professor Jay Siegel (Professor of Forensic Science and Associate Director of the School of Criminal Justice, Michigan State University)<sup>11</sup> considers lip print evidence to be admissible in court but the FBI has used lip prints as a means of positive identification only once.<sup>9</sup>

A current controversial case is that of *People v. Davis*, No. 2-97-0725 in an Appellate Court in Illinois, USA. The first court trial has accepted the evidence of two state police experts (a fingerprint examiner and a document examiner) that lip print identification is generally accepted within the forensic science community as a means of positive identification because it appears in the literature, that the identification methodology is an accepted form of scientific comparison, that there is no dissent within the forensic science community with regard to this technique and that the FBI has used it. This case has been appealed.

Each of the above statements has been and can be questioned. Although lip print identification may appear in the field literature there is very little science

or research to support Suzuki's theory that lip prints are individual, or to support a methodology, for the collection and comparison of lip prints, which has become accepted within the forensic community. Professor Andre Moessens (Professor of Law at University of Missouri-Kansas City School of Law and author of *Scientific Evidence in Civil and Criminal Cases*)<sup>12</sup> believes that with this lack of sound scientific basis, this technique would fail to meet any scientific standards of reliability.

In Australia the criteria for admitting or rejecting novel scientific evidence has not been defined.<sup>13</sup> However on the basis of several cases involving forensic dentistry [*Carroll v The Queen* (1985) 19A Crim R 410, *Lewis v The Queen* (1987) 29A Crim R 267, *Chamberlain v The Queen* (No 2 (1984) 153 CLR 521 at 558)] it appears that the acceptance of evidence related to forensic odontology relies on general acceptance of the evidence.

In New Zealand there is no clear line in relation to expert evidence but it appears that they are heading in the same direction as the United States of America.<sup>14</sup> In Canada in 1994 the Frye test was cited as being the relevant legal standard for the admissibility of novel scientific evidence.<sup>15</sup>

### **CONCLUSION**

Despite the fact that identification of an individual by lip prints appears to be accepted in some places this procedure for identification requires more study. The uniqueness of lip prints needs to be confirmed and accepted, a standard and uniform procedure needs to be developed for the collection, the development and recording of lip prints and the ensuing comparison that will occur. Until then identification by lip prints will not stand up to rigorous interrogation in court.

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**Address for correspondence***Dr Jenny Ball**Centre for Forensic Science**University of Western Australia,**35 Stirling Highway, Crawley 6009**Western Australia**Email: sweeball@inet.net.au*