

Wood's Lamp Examination: Evaluation of Basic Knowledge in General Physicians

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ABSTRACT

Background: Wood's lamp examination is a useful diagnostic test in many dermatological disorders. However, there was limited data on knowledge of physicians about this tool.

Objective: To evaluate basic knowledge of physicians on Wood's lamp and its applications.

Methods: The study used questionnaires in Thai general physicians who attended the 2013 Dermatology Annual Meeting. The questionnaire composed of a picture of a Wood's lamp instrument and two open-end questions including 1) What is the name of this device? 2) Which diseases can this device help to make the diagnosis?

Results: Eighty-two physicians enrolled in this study. Only 55 physicians (67.1%) answered the name of a Wood's lamp correctly. There were 29 out of 55 physicians (52.7%) knew at least one application of Wood's lamp. About half did not know any applications. Tinea versicolor, followed by melasma, tinea capitis, erythrasma, acne, porphyria, and vitiligo, respectively were the common applications that most physicians answered.

Conclusion: This study showed around two-third of physicians know Wood's lamp, but only half of them were knowledgeable about its' application in dermatoses. Education regarding Wood's lamp and application should be emphasized more in physicians to assist in dermatologic diagnoses.

Keywords: Wood's lamp examination, application, knowledge

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INTRODUCTION

Wood's lamp was invented by Robert Willams Wood in 1903. First it was used in dermatological practice for the detection of hair fungal infection by Margarot and Deveze in 1925.¹ Wood's lamp examination is a useful test to help in diagnosing many dermatological disorders. Wood's lamp produces an invisible long-wave ultraviolet radiation at the wavelength 340-450 nm (maximum at 365 nm). Those dermatoses have their own characteristic

fluorescence.^{1,2} For example, tinea versicolor shows yellowish-white or copper-orange. Tinea capitis shows blue-green (most *Microsporum* species) or occasionally dull yellow (*Microsporum gypseum*) and dull blue (*Trichophyton schoenleinii*). Epidermal melasma increased sharpness of borders under Wood's lamp. Dermal melasma demonstrates less color contrast. Erythrasma shows coral red and acne shows orangered color in Wood's lamp examination. Porphyrias cause red-pink fluorescence in urine. Vitiligo demonstrates patches which cause enhanced border contrast under Wood's lamp examination and fluoresce bright blue-white.^{1,3} There are also other dermatoses which can use Wood's lamp to help with the diagnosis. Other advantages of using Wood's lamp included that it is portable

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and easy to use. Wood's lamp examination does not cause any pain to patients and does not need any preparation before the test. Moreover, it can help in collecting the specimens from the exact site of several skin lesions in order to increase the yield for positive results.⁴

Even though the use of Wood's lamp to delineate skin lesions is a useful technique in many dermatological conditions, the study about physicians' knowledge of Wood's lamp was limited. Therefore, this study aimed to demonstrate the knowledge of Thai physicians about Wood's lamp and its application. This assessment would provide the important information to improve medical education.

MATERIALS AND METHODS

This study was questionnaire-based in Thai physicians who attended the annual meeting in Dermatology conducted by the Dermatological Society of Thailand during 2011-2013. The assessment comprised a picture of a Wood's lamp and 2 open-end questions as follows:

- 1) What is the name of this device?
- 2) What are the diseases which this device can help in diagnosing?

Furthermore, the questionnaire consisted of demographic data and questions about their daily work practice i.e. number of patients they examine per day and their confidence to take care of dermatologic patients. The participants were asked about their confidence in examination of patients with skin conditions and the answer were divided into 1) very low confidence, 2) low confidence, 3) moderate confidence and 4) high confidence. Then participants were divided into 2 groups (very low to low confidence group and moderate to high confidence group). The questions about Wood's lamp were assessed and compared in both groups. This study was approved by the Institutional Review Board of the Faculty of Medicine Siriraj Hospital.

Statistical analysis included descriptive analysis as well as Chi-square test which was used to compare differences in categorical data. A p value less than 0.05 was considered statistically significant. The odds ratio with 95% confidence

interval was also calculated for each relevant variable. All analyses were performed using the Statistical Package for the Social Sciences (SPSS) for Windows (Version 18.0; Chicago, IL, USA).

RESULTS

Eighty two responders voluntarily returned their answer sheets. The response rate of the survey was 90%. Fifty eight (70.7%) of the responders were female. Of those, 35.3% were between 21-25 years, 42.6% were in 26-30 years, and the other 21.9% were more than 30 years of age. All of them were general practitioners and non-dermatologists. Only 55 patients (67.1%) knew the name of Wood's lamp. The others (19.5%) replied with incomplete answers (17% physicians replied fluorescent light, and 2.4% replied ultraviolet light). Demographic data and knowledge of Thai physicians enrolled in this study were demonstrated in Table 1.

Of the 55 physicians, most of them (79.2%) were 20-25 years old. According to their confidence in taking care of patients with dermatological problems, 62.5% of physician in moderate to high confidence group and 68.2% of physician in low and very low confidence groups knew the Wood's lamp. The Wood's lamp recognition was not significantly different between these two groups ($p=0.664$). Only 29 out of 55 patients (Earlier the authors stated they were physicians and here they state the respondents were patients.) (52.7%) know at least one indication to use the Wood's lamp. Most of them could answer tinea versicolor, followed by melasma, tinea capitis, erythrasma/acne, porphyria, and vitiligo, respectively.

There were 7 physicians (8.5%) who answered correctly more than one indication. Among them, 3 physicians answered 2 indications, another 3 physicians answered 3 indications, and the other one answered 4 indications. All physicians who got 2 to 3 indications were general practitioners at the age range between 26-30 years. One physician who got 4 indications which was the highest score graduated from an international diploma course and this physician's answers included tinea capitis, tinea versicolor, erythrasma, and porphyria.

TABLE 1. Demographic data and knowledge of Thai physician enrolled in this study.

Characteristics	Numbers=82 (%)
Sex; Female	58(70.7%)
Age (years)	
21 - 25	29 (35.3%)
26 - 30	35 (42.6%)
More than 30	18 (21.9%)
Numbers of dermatologic patients examined by the physician (per week) (n = 55)	
0-5 patients	15 (27.3%)
6-10 patients	16 (29.1%)
11-20 patients	14 (25.2%)
>20 patients	10 (18.2%)
Know Wood's lamp	55 (67.1%)
According to their confidence in taking care of patients with dermatological problems	
Physician in moderate to high confidence group (n=16)	10 (62.5%)
Physician in low and very low confidence groups (n=66)	45 (68.2%)
Numbers of correct answers about Wood's lamp application (n=29)	
1 indication	22 (75.8%)
2 indications	3 (10.4%)
3 indications	3 (10.4%)
4 indications	1 (3.4%)

DISCUSSION

Wood's lamp is a valuable device in dermatology. It is small, durable, inexpensive, safe and very easy to use.¹ There are several common dermatologic conditions that general physicians are consulted which can be diagnosed by Wood's lamp examination. Wood's lamp can demonstrate florescent light in some infections such as tinea capitis, tinea versicolor and erythrasma. Not only can it yield accurate diagnosis, but it can also point to the precise site to collect the specimen. Moreover, Wood's lamp is the easy way to give a provisional diagnosis in porphyria disease, especially porphyria cutanea tarda which is frequently found in Thai patients.⁵ This investigation can be performed in any level of hospital by using urine from patients with porphyria cutanea tarda which shows red to pink color under Wood's lamp examination. Furthermore, Wood's lamp is able to distinguish problematic lesions such as vitiligo by contrast finding which is useful in both diagnosis and follow up. Wood's lamp applications were listed in Table 2 and results of some investigations

were demonstrated in Fig 1-3. In addition, the use of a Wood's lamp does not require great skill. However, some experience and practical points should be kept in mind to avoid misinterpretation of results shown in Table 3.^{1,4}

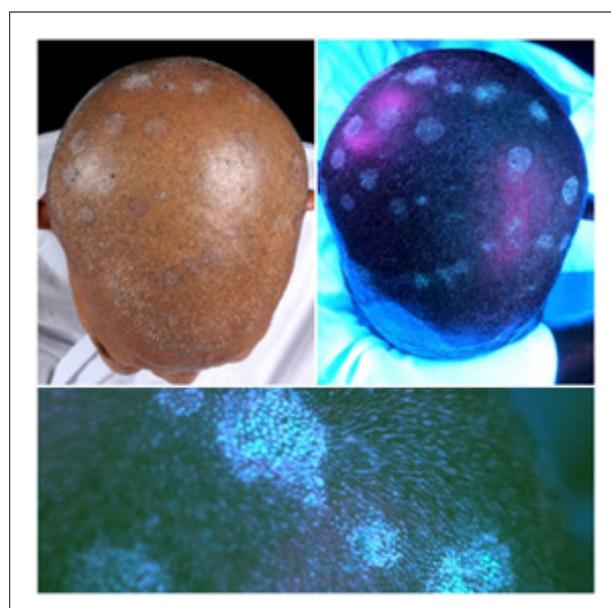


Fig 1. The blue-green fluorescence under Wood's lamp examination in patient with tinea capitis.

TABLE 2. Literature review on the subject of Wood’s lamp applications and medical competency assessment criteria for Thai national license in 2012.^{1,4}

Medical conditions	Color of florescence or contrast findings	MCA criteria*
Tinea capitis		Yes
<i>Microsporum audouinii</i>	Florescence blue-green	
<i>Microsporum canis</i>	Florescence blue-green	
<i>Microsporum ferrugineum</i>	Florescence blue-green	
<i>Microsporum distortum</i>	Florescence blue-green	
<i>Microsporum gypseum</i>	Florescence dull-yellow	
<i>Trichophyton schoenleinii</i>	Florescence dull-blue	
Tinea versicolor (<i>Malassezia</i> spp.)	Florescence yellowish-white or copper-orange	Yes
Acne		
<i>Propionibacterium acne</i>	Florescence orange-red	Yes
Erythrasma		
<i>Corynebacterium minutissimum</i>	Florescence coral red	No
Porphyria diseases including erythropoietic porphyria, erythropoietic protoporphyria, hepatoerythropoietic porphyria, porphyria cutanea tarda and variegata porphyria	Florescence red-pink	No
Vitiligo	Enhanced contrast	Yes
Melasma	Enhanced contrast	Yes
Scabetic burrow	Tetracycline enhancement	Yes
Pediculosis	Enhanced contrast	Yes
Detection of semen in cases of sexual abuse	Enhanced contrast	No

*Medical competency assessment criteria for Thai national license in 2012 defined as physician must know this subjects.



Fig 2. The coral red of *Corynebacterium minutissimum* in erythrasma under Wood’s lamp examination.

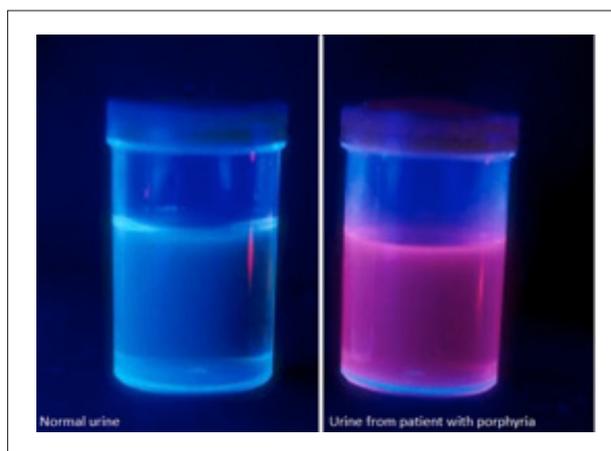


Fig 3. The red-pink of urine in patient with porphyria cutanea tarda (right) comparing with urine in normal person (left) under Wood’s lamp examination (Courtesy by Dr. Rasthawathana Desomchoke).

TABLE 3. Common pitfalls when using a Wood's lamp.^{1,4}

Problems	Details and solutions
Insufficient warm up time	Wood's lamp requires a minimum of 1 minute warm up before using.
Unadjusted physicians vision	Before an examination the physician should adapt their vision to a complete dark room
The darkness of the examination room	The room should be completely dark or preferable with black occlusive shades
The distance between wood's lamp and the skin lesions	The distance between wood's lamp and the suspected lesions should be around 4-5 inches
Interference from chemical substance i.e. Lint, soap or topical medications	Can create a false positives usually in pink to red in fluorescence
Wash targeted area before examination	Can create a false negatives due to dilution of substances
Limited in detecting some dermatophytes	i.e. <i>T.rubrum</i> , <i>T.metagrophytes</i> , <i>T.violaceum</i> in tinea capitis doesn't fluorescent under wood's lamp

Despite many benefits of Wood's lamp, this study showed that only two-thirds of physicians knew Wood's lamp and unfortunately only half of them were knowledgeable about when to use it in dermatology. Physicians with higher qualifications in dermatology have better knowledge towards Wood's lamp examination. According to their confidence in taking care of patients with dermatological problems, physicians in moderate to high confidence group and in low and very low confidence groups had no significant difference regarding knowledge the Wood's lamp. This may be due to limitation of daily practice in Wood's lamp examination including availability of Wood's lamp in their clinics and hospitals. The medical competency assessment criteria for the national license in Thailand requires many dermatologic conditions for general physicians to know, but does not include Wood's lamp application.

This study had some limitations. First, assessment by only Wood's lamp picture may not completely evaluate physician's knowledge about a disease because of variations in shape of instrument. Second, there was selection bias in recruitment because general practitioners that enrolled in this study may be interested in dermatology, so they came to attend dermatologic conference. However, this study demonstrated that only two-thirds of physicians knew Wood's

lamp and unfortunately only half of them were knowledgeable about diagnosing with Wood's lamp.

In conclusion, this study showed around two-thirds of physicians knew Wood's lamp, but only half of them were knowledgeable about its' application in dermatoses. Education regarding Wood's lamp and application should be emphasized more in physicians to assist in dermatologic diagnoses.

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