

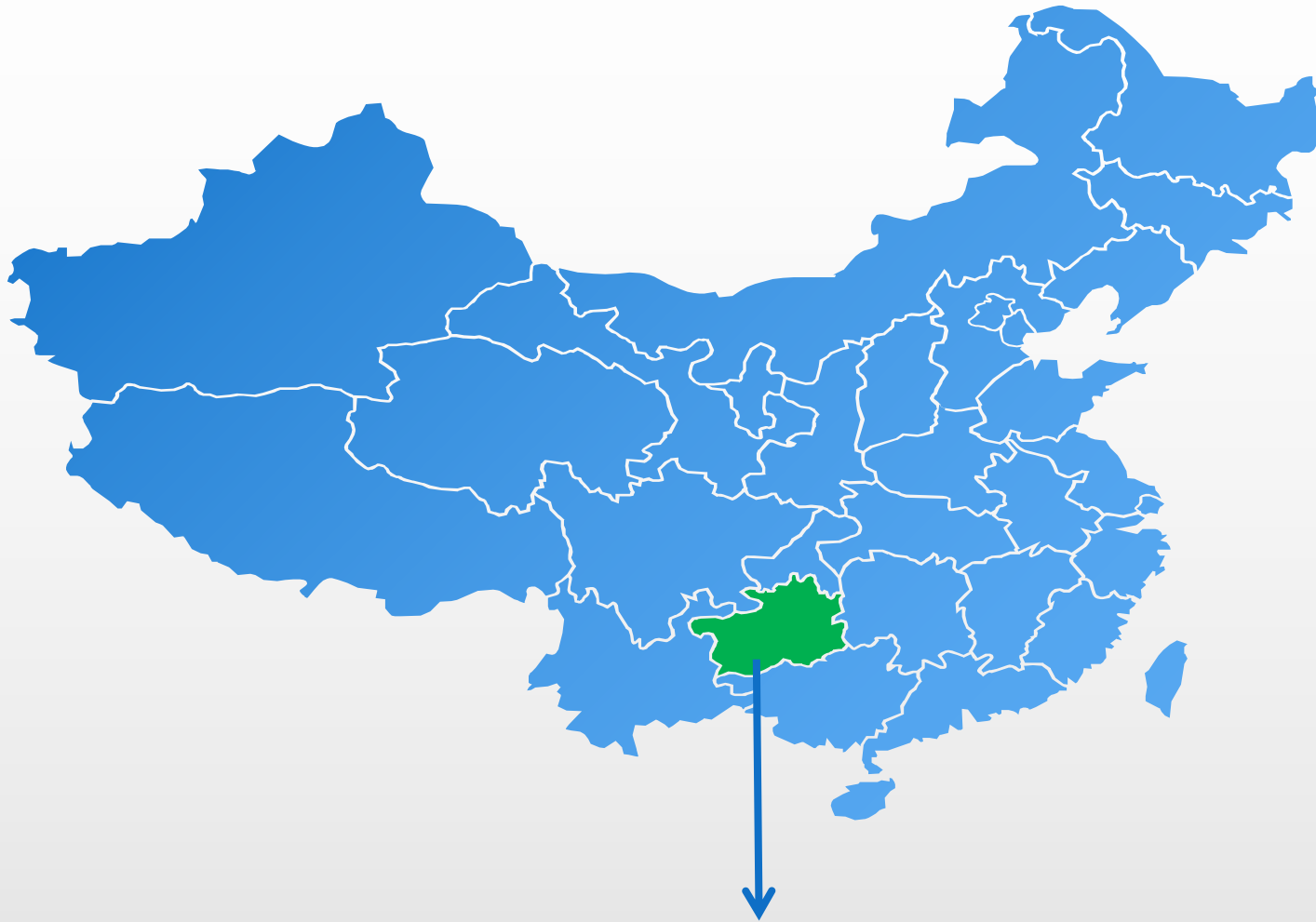


GUIZHOU PROVINCIAL PEOPLE'S HOSPITAL

Design and Application of a Special Oral Mask for Patients with Mouth Breathing

Min Zou

2020.04.24



Guizhou is located in the southwest of China. It is the most complete province of Chinese ethnic groups, with 56 ethnic groups.

Tourism in Guizhou



Huangguoshu Waterfall

The largest waterfall
in China and Asia.



China Sky Eye

It is a spherical radio
telescope with a diameter of
500 meters.



**Xijiang Thousand
Households Miao Village**

- ◆ the Miao people's ecological culture is complete.
- ◆ The largest Miao village in the world.



Introduction of Guizhou Provincial People's Hospital



1947

1957

2015

2020





Introduction of Guizhou Provincial People's Hospital



- **It is located in Guiyang City, Guizhou Province, China.**
- **3A general hospital.**
- **The Affiliated Hospital of Guizhou University.**
- **3000 beds**
- **61 clinical and medical technology departments**
- **4335 employees**



Introduction of Guizhou Provincial People's Hospital

➔ Guizhou Provincial People's Hospital ranked **57th** in the nursing discipline of the Chinese Hospital Science and Technology Evaluation Metrics (STEM) 2018.

中国医院科技量值研究 STEM

首页 综合结果 学科结果 地区结果 评价方法 联系我们

学科结果 > 2018 > 护理学

2014年 2015年 2016年 2017年 2018年

学科分类	排序	地区分布	科技产出	学术影响	科技条件	量值
心血管病学	41	南通大学附属医院	24.75	17.48	26.11	68.34
呼吸病学	42	武汉大学中南医院	24.59	14.70	28.88	68.17
结核病学	43	首都医科大学附属北京儿童医院	21.86	17.38	28.88	68.12
消化病学	44	复旦大学附属华山医院	22.92	16.10	28.88	67.90
血液病学	45	山东大学齐鲁医院	25.37	16.29	26.11	67.77
肾脏病学	46	中山大学附属第三医院	23.60	15.24	28.88	67.72
内分泌病学与代谢病	47	宜昌市第一人民医院	21.83	13.68	32.15	67.66
风湿病学与自体免疫	48	中日友好医院	23.37	15.20	28.88	67.45
变态反应学	49	中南大学湘雅三医院	24.50	16.66	26.11	67.27
传染病学	50	河南省人民医院	23.42	14.96	28.88	67.26
普通外科学	51	湖南省肿瘤医院	23.18	15.08	28.88	67.14
神经外科学	52	首都医科大学附属北京天坛医院	23.13	15.09	28.88	67.10
胸外科学	53	南京军区南京总医院	25.08	15.77	26.11	66.96
心血管外科学	54	新疆医科大学第一附属医院	23.39	14.68	28.88	66.95
泌尿外科学	55	上海市第十人民医院	22.45	15.59	28.88	66.92
骨外科学	56	中国科学技术大学附属第一医院(安徽省立医院)	22.96	14.90	28.88	66.74
烧伤外科学	57	贵州省人民医院	23.40	14.30	28.88	66.58
整形外科	58	武汉大学人民医院	23.66	14.02	28.88	66.56
妇产科学	59	中南大学湘雅二医院	24.51	15.76	26.11	66.38
儿科学	60	中山大学肿瘤防治中心	24.38	15.88	26.11	66.37



Min Zou

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- **Geriatric Nurse Specialist**
- **Master of Science in Nursing , Chongqing Medical University**
- **National Level 2 Psychological Counselor**
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1. Research Background

Mouth Breathing

◆ Patients with mouth breathing are common in many situations. such as, loss of consciousness, obesity, advanced age, falling back of tongue, and critical illness.

◆ **Dry mouth, Bleeding, Infection.**

◆ **Hypoxia, Lung Infection, Atelectasis, and even Death.**

➤ **Oral protection is particularly important !**

[1] Wang C. Course of respiratory therapy [M]. Beijing: People's Medical Publishing House, 2010: 92-97.

[2] Al-Awadi R N, Al-Casey M. Oral health status, salivary physical properties and salivary Mutans Streptococci among a group of mouth breathing patients in comparison to nose breathing [J]. Journal of Baghdad College of Dentistry, 2013, 25(Special Issue 1):152-159.



1. Research Background

Existing oral protection methods

- Normal saline gauze covering
- Oral spray
- Mouth-opening breathing aid



- **Care effect is not ideal**
- **Patients' experience is poor**
- **Caregiver burden is heavy**
- **Nurses have a heavy workload**

- [3] Hongfang C, Zhihui L, Huiqing W. Observation of the effect of oral spray on stroke patients with open mouth breathing [J]. Journal of Nurse Training, 2011, 26 (19): 1752-1753.
[4] Yuemin H. Evaluation of the effect of assisted oral spray on stroke patients with open mouth breathing [J]. Journal of General Stomatology, 2016, 3 (9): 28-29.
[5] Lingli S, Ruiping H, Zhuying W. Application of self-made mouth-opening breathing aid in patients after nasal cavity surgery [J]. Journal of Nurse Training, 2012, 27 (10): 60.
[6] Jing L, Junping L, Xiaoli H, et al. Application of self-made oral ventilation tube in patients after nasal cavity surgery [J]. Journal of Nursing, 2013, 28 (24): 29-31.
[7] Hongfen L, Zhongjun L. Application of oral humidified ventilation tube in patients after nasal cavity surgery [J]. Journal of Nurse Training, 2015, 30 (18): 96-98.



1. Research Background

Gauze slips off easily

01



02

Patients feels discomfort

Increased material consumption

03

04

Increased the workload

Traditional method :
sterile saline gauze covers the patient's mouth .



2. Research Objective

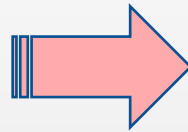
Invented a special oral mask for patients with mouth-opening breathing, and used in the clinical practice to test its effect. We hope it can provide reference for the care of patients with mouth-opening breathing.



3. Research Methods

3.1 Established a Continuous Quality Improvement (CQI) team

- Multi-disciplinary team: clinical nursing experts, geriatric experts, rehabilitation physicians and respiratory therapists.
- Brainstorming designed samples.
- Continuously monitor and analyze the effect of samples.

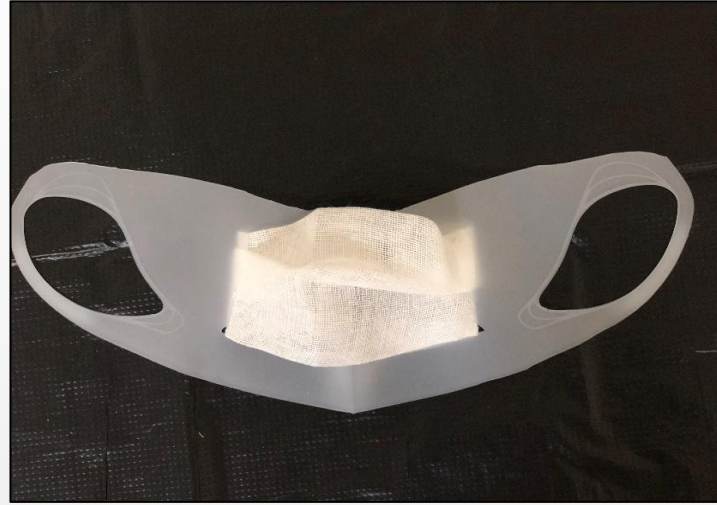


**Special oral mask for patients
with mouth breathing**



3. Research Methods

3.2 Solutions through the planning-do-check-action(PDCA) cycle



- ✓ Design ear-hanging face mask combined with linear opening at the lips to facilitate gauze fixation and replacement.
- ✓ The design mask is made of environmentally friendly silicone fabric, which is safe in material, good in skin-friendliness, and suitable for wearing.
- ✓ Uniformly use a 1 ml syringe to slowly infiltrate the gauze.



3. Research Methods

3.3 Conducted a clinical application research

- ◆ **Conducted an interventional study** in the Guizhou Provincial People's Hospital from March to September 2019.
- ◆ **Ethical approval was obtained** from EC of Guizhou Provincial People's Hospital
- ◆ The study included **80 participants**. The patients were divided into the test group and the control group, **40 cases in each group**.
- ◆ We observed **the rate of lip bleeding/oral ulcer/ lung infection, hospitalization time, total cost of oral care**, and **patient oral care satisfaction** during the application period.



4. Research Results

4.1 Indicator data statistical analysis results

4.1.1 Clinical practice effect

Group / samples	lip bleeding	oral ulcer	lung infection	oral care satisfaction	
Control group/40	10%	25%	62.5%	65%	p<0 . 05
Test group/40	2.5%	1.8%	27.5%	92.5%	



4. Research Results

4.1 Indicator data statistical analysis results

4.1.2 Economic Benefit Analysis

Group / samples	hospitalization time (Day)	Amount of gauze used per day	Cost of gauze used per day (RMB)	Other costs (RMB)	Total Cost (RMB)	p<0 . 05
Control group/40	1118	358	71.6	0	80048.8	
Test group/40	1023	244	48.8	10	60152.4	

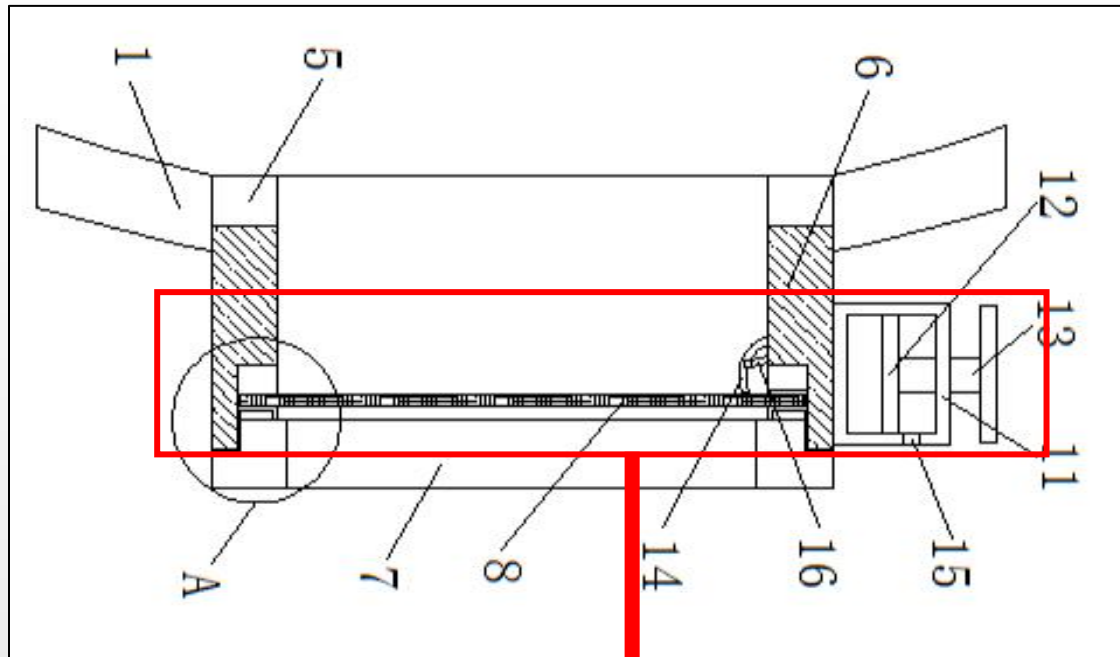
Note: (1) Gauze: 0.2 RMB/piece.

(2) Other costs refer to the cost of appliances used for oral protection. The improved group need 10 RMB for the special oral mask. The mask can be reused after disinfection.

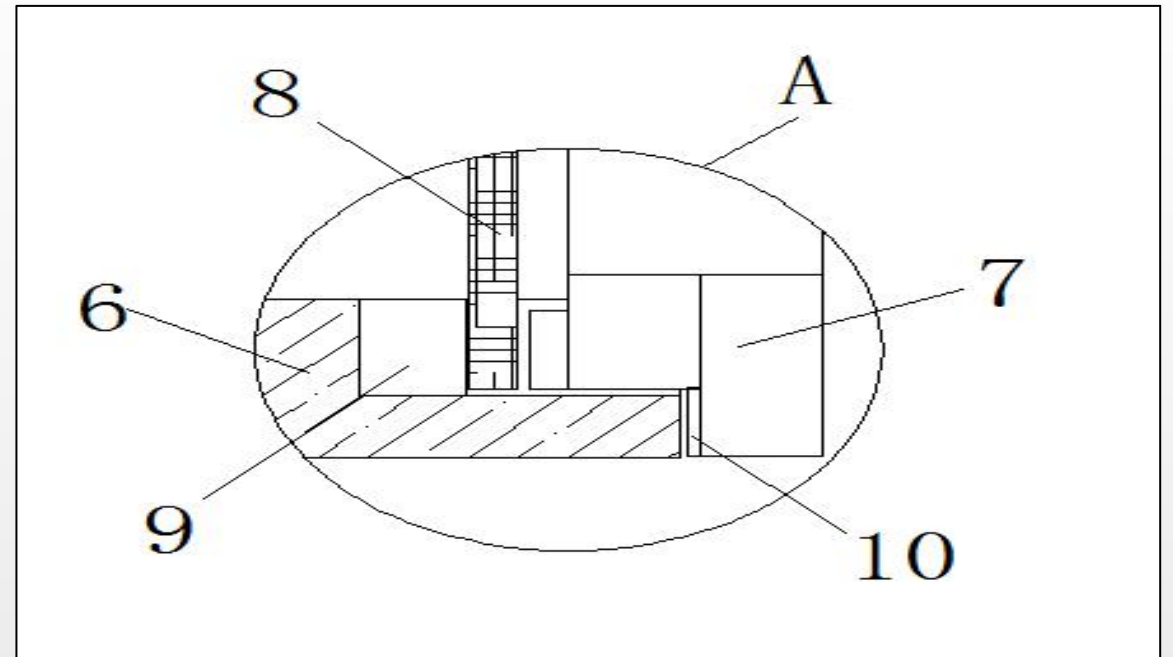


4. Research Results

4.2 Continuous quality improvement.



Liquid storage device



7-Clamp ring
9-Magnetic disk



4. Research Results

4.2 Continuous quality improvement.

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申请号：201920217488.1
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申请人：贵州省人民医院
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1/2

Apply for a national patent.



5. Research Conclusion

5.1 Innovation process

This is the first time for patients with mouth breathing to have their own special oral protective mask.

- The ear-hanging design, the linear opening of the lips, and the fixing method of the combination of the magnetic sheet and the clamping ring , **solve the problem that the gauze cannot be properly fixed** in the traditional oral cavity protection process.
- The way in which the piston controls the liquid storage cylinder **solves the problem of uneven wetting gauze** in the traditional oral protection process.
- Silicone material **increases the comfort in oral care** for patients.



5. Research Conclusion

5.2 Patients, family members and nurses all benefited.



Patient

- ✓ More comfortable.
- ✓ Oral cavity can be effectively moisturized and protected.
- ✓ Does not affect head movements.

Family

Reduce the burden of care.

Nurse

Easy to operate.
Reduce the workload.



5. Research Conclusion

Compared with the traditional oral cavity protection mode, **the Special Oral Mask can optimize the protection effect**, and it is closely related to the patient's disease progression and prognosis. It can **reduce the hospitalization time and the total hospitalization costs.**



GUIZHOU PROVINCIAL PEOPLE'S HOSPITAL

**Design and Application of a Special Oral Mask
for Patients with Mouth Breathing**

Thank you for your listening!

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