
16.1 Nursing Care Management in Fever Clinics

Since SARS epidemic beginning in Sep. 2002 in China, many hospitals established fever clinics to separate fever patients from common patients to control the spreading of infectious diseases. Such a measure played an indispensable role in curbing the spread of SARS.

16.1.1 Fever Clinics/Emergency Room

The medical institutions should be required to set up fever clinics and a system of pre-examination for triage should be established for patients to get appropriate treatments in fever clinics. The following measures should be taken in fever clinics:

1. To set up an independent area for fever clinic with eye attracting signboard and with both entrance and exit independent of general out-patients'.
2. The waiting area of the fever clinic should be well ventilated and spacious enough for waiting patients.
3. A spare consulting room should be prepared.
4. A toilet should be independently prepared.
5. Registration department, consulting rooms and pharmacies should be independent of those in general clinics.
6. Patients with fever and acute respiratory symptoms should wear surgical face masks, cover nose and mouth with a tissue when coughing or sneezing and dispose of the tissue to medical wastes containers.
7. Standard preventive measures and preventive measures against droplet transmission should be applied when medical staffs closely contact (with a distance of less than 1 m) with patients with fever and acute respiratory symptoms. Patients should wear surgical face masks.
8. Isolated observation rooms should be set up, which should be in an independent area with eye attracting signboard.

A suspected patient should be quarantined in a single room equipped with bathroom. Patients should wear a surgical face masks and can move around only in the observation room.

16.1.2 Nursing Care Responsibilities in Fever Clinics/Emergency Rooms

1. The consultation in fever clinic should be performed in an enclosed area with certain procedures. Based on the patients' conditions, the patients should be timely and accurately triaged. The direct contacts between fever patients and other patients should be avoided. Protective face masks should be distributed to patients and the consulting time should be as short as possible.
2. Protective quarantine between fever patients should be well performed. The patients with definitive diagnosis, suspected diagnosis and patients for medical observations should be strictly distinguished for placement to avoid cross infections. Meanwhile, the patients conditions should be closely observed and recorded in detail. Any abnormalities should be timely reported to physicians and necessary assistance in management should be performed.
3. After the consultation, the nurse should record in detail the patients' final diagnosis and the recommendations and therapies for future inquiries.
4. For patients with confirmative or suspected diagnosis, their personal data including residence address, work unit address, telephone number of the patients should be reported to the local CDC and they should be quickly transferred to the designated hospital or designated inpatients area. The family members of patients with confirmative or suspected diagnosis should be quarantined according to the national law on the prevention treatment of infectious diseases.

16.2 Nursing Care in Inpatient Areas

16.2.1 Requirements for Working Staffs (Class II Protection)

Principle: Limit the number of working staffs who make contacts to patients.

These working staffs should not be assigned to attend other patients. The number of other hospital staffs who have access to these patients, such as cleaners and laboratory workers, should also be restricted.

The body temperatures of the working staffs who have direct contact with patients should be measured and recorded twice daily by themselves. Any occurrence of fever should be reported to the hospital administration. Once these working staffs who have direct contacts with patients are found to have a body temperature of above 38 °C, they should receive treatment immediately.

The working staffs who feel ill should not be appointed to directly attend patients because their exposure to Influenza A (H1N1) virus may cause them more susceptible to Influenza A (H1N1) or may have increased chances of severe diseases.

1. Medical protective masks must be worn when one enters the quarantined observation room and specialized inpatients areas. And the medical protective masks should be changed every 4 h or when sense of wetness is felt. In addition, other protective measures including work clothing, special clothing for quarantine, gloves, shoes cover and working cap should be worn.
2. After attendance to the patient, the working staffs should wash and sterilize their hands as soon as possible. For hands sterilization, 0.3–0.5 % iodophor disinfectant solution can be applied. Alternatively, instant hand disinfectant (acetate chlorhexidine alcohol solution, benzalkonium bromide in alcohol solution or 75 % alcohol) can be applied to rub hands for 1–3 min.
3. Treatment, nursing care and daily activities of patients should be limited within the wards.
4. Operations of treatment or nursing care within a short distance to patients should be performed with protective glasses worn.

16.2.2 Management Requirements for Patients

Patients who are classified as medically observed patients or with a history of close contact with definitive diagnosed patients should be medically observed for 7 days. The confirmatively diagnosed and suspected patients should be separately managed.

For the suspected patients, a single room should be prepared for one patient to be medically observed. Several suspected patients sharing one room is prohibited.

For the confirmatively diagnosed patients, the patients should be admitted to the designated hospital. Several patients can share one room. Such patients should be quarantined within designated wards with >1 cm interval between ward beds. Physical barriers (such as curtains and screens) should be preferably used to separate ward beds.

16.2.3 Management Requirements for Circumstances of Inpatients Areas

The quarantine wards should have eye-attracting signboard and the visits should be limited. Specific ways should be dedicated respectively for working staffs and patients.

1. The wards should be well-ventilated in an independent area with an eyes attracting signboard.

The ward should be reasonably layout, with a clean area, a semi-contaminated area and a contaminated area, with no overlapping to each other. A buffer zone should be divided out respectively in the three areas with an isolating barrier.

2. Offices for medical staffs should be well-ventilated and isolated from wards without crossed area, preferably with a certain distance.
3. Visitors and working staffs entering into the wards must be protected with class II protection, measures including wearing cotton masks of more than 12 layers, caps, gloves, quarantining clothes, shoes covers.
4. A staff member should be designated to inspect the protective measures adopted by visitors and working staffs.
5. Hospitalized patients are required to wear a mask, strictly quarantined and managed. Their leaving the ward is prohibited.
6. A visiting regulatory system should be strictly implemented. No companions and no visitors are permitted. For critically and severely ill patients, the visitors should be protected with class II protective measures, including wearing cotton masks of more than 12 layers, caps, gloves, clothes covers and shoes covers.

16.2.4 Management Requirements for Environments and Medical Materials

According to the guidelines for infection regulation in hospitals,

1. Enough expertise in disinfection and quarantine, such as disinfection of patients' excrements and secretions, disinfection of air and medical history notebooks, disinfection of contaminated places and medical materials and terminal management of medical materials (equipments, medical history notebooks, wards, clothes, bed sheets) after discharge or death.

2. Improved wards conditions, with restricted visitors flow and strictly regulated cleaning procedures to prevent cross-infection.
3. Improved wards equipments, with favorable reservations of beds, equipments, facilities, pharmaceuticals, vehicles and other protective equipments.

16.3 Basic Protective Measures

16.3.1 Personal Protection of Medical Staffs

16.3.1.1 Class I Protection

1. It is appropriate for medical staffs working in fever clinics/emergency departments.
2. In working clothes, gloves and caps.
3. After attendance to the patients, the medical staffs should immediately wash and sterilize their hands. For sterilizing hands, 0.3–0.5 % iodophor disinfectant solution can be used or instant hand disinfectants (acetate chlorhexidine alcohol solution, benzalkonium bromide in alcohol solution, 75 % alcohol) can be used to rub hands for 1–3 min.

16.3.1.2 Class II Protection

1. It is appropriate for medical staffs who have access to the quarantined observation rooms and specialized inpatients areas, who collect specimens from bodies of the patients, who manage the patients' secretions, excrements, personal belongings and corpses and those medical staffs and drivers with responsibilities of transferring patients.
2. Medical protective face masks must be worn by anyone who has access to the observation rooms and specialized inpatients wards. The face mask should be changed every 4 h or when sense of wetness is felt. In addition, working clothes, clothes covers, gloves and caps should be worn.
3. After attendance to the patients, the medical staffs should immediately wash and sterilize their hands. For sterilizing hands, 0.3–0.5 % iodophor disinfectant solution can be used or instant hand disinfectants (acetate chlorhexidine alcohol solution, benzalkonium bromide in alcohol solution, 75 % alcohol) can be used to rub hands for 1–3 min.
4. A pair of protective glasses should be worn during operations in a short distance from the patients.
5. The respiratory tract and mucous membrane should be given focused protection.

16.3.1.3 Class III Protection

1. It is appropriate for the medical staffs performing sputum suction, tracheotomy and endotracheal intubation for patients.
2. In addition to class II protection, the medical staffs should also wear a comprehensive respiratory protector.

16.3.2 Requirements and Methods for Hand-Cleaning and Hand-Disinfection

16.3.2.1 Requirements for Hand-Washing

1. Before and after attendance to the suspicious, suspected and confirmative cases of Influenza A (H1N1).
2. After contacts to blood, body fluids, excrements, secretions and contaminated materials.
3. Before wearing protective wares for access to quarantined inpatients wards and after taking off protective wares leaving quarantined inpatients wards.
4. For the same patient, before the shift from contaminated operations to clean operations.
5. Before wearing gloves or after taking off gloves.

16.3.2.2 Requirements for Hand-Disinfection

1. After contacts to the suspicious, suspected or confirmed patients of Influenza A (H1N1).
2. After contacts to infected wounds, blood, body fluids, excretions and secretions of Influenza A (H1N1).
3. After taking off protective wares leaving quarantined wards, ICU or other contaminated areas.
4. After contacts to materials contaminated by swine flu viruses.

16.3.2.3 Methods of Hand-Disinfection

After attendance to the patients, the medical staffs should immediately wash and sterilize their hands. For sterilizing hands, 0.3–0.5 % iodophor disinfectant solution can be used or instant hand disinfectants (acetate chlorhexidine alcohol solution, benzalkonium bromide in alcohol solution, 75 % alcohol) can be used to rub hands for 1–3 min.

16.3.3 Requirements for Protective Equipments

16.3.3.1 Requirements for Protective Wearings Dressing of Non-integrated Protective Suits

1. About wearing a face mask: one hand holds the mask and put it on in proper place. The other hand makes the mask fixed and pinches the nose to the nose bridge. Check the tightness of the mask.
2. Wearing goggles or mask
3. About wearing a cap: hands should not touch face when wearing a cap.
4. Wear protective clothes.
5. Wear boots or disinfected protective shoes covers.
6. After wearing gloves, fix the cuff of protective clothes in gloves.

Undressing of Non-integrated Protective Suits

1. Undress the non-integrated protective suits in the lobby of the quarantine room (to be cautious of not contaminating

other persons in the lobby) after leaving the quarantined room or the contaminated area.

2. Take off gloves, with inside out and put them into a yellow plastic bag.
3. Wash hands.
4. Take off protective suits and shoes covers, with inside out; then put them into a yellow plastic bag.
5. Wash hands.
6. Put fingers into the cap and take it off carefully, with inside out; then put them into a yellow plastic bag. Take off the protective goggled and the whole face protective mask.
7. Wash hands.
8. Take off the mask with one hand holding the mask and the other hand taking it off. The hands should not touch the face.
9. Wash hands.

Dressing of Integrated Protective Suits

1. Wear disposable cap.
2. Wear a mask or a whole face protective mask. And check the tightness of the mask.
3. Wear goggles or mask.
4. Wear integrated protective suits (wear the protective cap).
5. Wear boots or disinfectable protective shoes covers.
6. After wearing gloves, fix the cuff of protective suits in gloves.

Undressing of Integrated Protective Suits

1. Undress in the lobby of the quarantine room (to be cautious of not contaminating other persons in the lobby) after leaving the quarantined room or the contaminated area.
2. Take off gloves with inside out and put them into a yellow plastic bag.
3. Wash hands.
4. Take off integrated protective suits and shoes covers with inside out. Then put them into a yellow plastic bag.
5. Wash hands.
6. Take off the protective glasses and the whole face protective mask. And take off the mask, with one hand holding the mask and the other hand taking it off. Hands should not touch face.
7. Wash hands.
8. Put fingers into the cap and take it off carefully with inside out. Then put them into a yellow plastic bag.
9. Wash hands.

16.3.3.2 Requirements for Protective Medical Materials

Protective Clothing

Protective clothing should be in line with “Technical Requirements for Medical Disposable Protective Clothing” (GB 19082-2003), including integrated protective suits and non-integrated protective suits. The protective clothing should be easy for medical staffs to wear and take off with rigorous

junctions. The cuff and the trousers should have elastic openings. And the protective clothing should be waterproof, anti-static, filtering efficient and have no irritation to skin.

Protective Mask

Protective masks should be in line with “Technical Requirements for Medical Disposable Protective Clothing” (GB 19082-2003), including rectangular type and closed type. Protective masks should be equipped with nose clips, have good surface moisture resistance and no irritation to skin. At the air flow of 85 L/min, the inspiratory resistance should not exceed 35 mmH₂O. The particle filtration efficiency of the filter should be not less than 95 %. The protective masks produced up to the standards of N95 or FFP2 can also be applied.

Others

Protective medical materials should be actually needed.

16.4 Nursing of Common Patients

16.4.1 Daily Nursing Care

A comfortable, clean, quiet, safe environment appropriate for rest should be provided for the patients. Good ventilation is necessary to ensure the unidirectional air flow from clean area to the semi-contaminated area to the contaminated area. Air, surfaces and floor should be regularly disinfected. And the ward room temperature should be kept between 18–22 °C, with a humidity of 50–70 %. Beds should be kept clean, soft and dry.

The patients should have adequate rest and the daily nursing care should be performed during a short period of time to reduce times of disturbing. Meanwhile the oxygen consumption of patients should be possibly minimized.

Due to varying degrees of fever occur in almost all patients, the patients show a large consumption of substances. Therefore, nutritional substances and water supplements should be supplied. The diet quality should be ensured with attention to the patients dieting habits. Nutritional balance should be well kept. Diets with high energy, high protein, high vitamin contents and low fat should be provided. The patients with persistent high fever should be given liquid or semi-liquid diet. The patients should drink more water, even receive intravenous supplement of liquid when necessary.

16.4.2 Observation and Nursing Care

16.4.2.1 Vital Signs Monitoring

1. Body temperature

High body temperature is the most commonly found vital sign. And the body temperatures should be taken every 4 h. For patients receiving physical cooling or drugs cooling,

the body temperature should be reexamined half an hour after the cooling to observe the effects of cooling.

2. Pulse

The frequency, rhythm and strength of pulse should be examined. And the synchronic changes with heart rate should be noted.

3. Breathing

The respiration rate of the patient should be formally examined for 1 min. The frequency of examination should be based on the physical conditions of the patient.

4. Blood pressure

Blood pressure should be measured every 4 h. For severe cases, ECG monitoring should be performed.

16.4.2.2 General Conditions

The conditions should be observed for mental conditions, headache, dizziness, anxiety, lethargy, cyanosis or paleness of skin and mucus, yellow sclera.

16.4.2.3 Respiratory System

1. Influenza A (H1N1) can cause respiratory failure. Therefore, it is especially important to observe the respiratory system. The patients' breathing rhythm, frequency and depth as well as dyspnea, cyanosis and chest pain should be observed. SpO₂ should be monitored. Any change of the patients' conditions should be reported to the physicians in charge. The cough, color of sputum and volume of sputum should also be observed.
2. Reasonable oxygen therapy should be given according to the physician's recommendation when hypoxemia occurs. Nasal cannula for oxygen inhalation or mask oxygen inhalation with proper fixation can be performed based on the conditions of the patients. The humidity and temperature of inhaled gas should be given close attention. The humidity bottle should be regularly changed. The oxygen flow should be regulated according to the patients' conditions and generally a high oxygen flow is needed to keep SpO₂ above 93 %. The respiratory tract should be kept unobstructed.

16.4.3 Psychological Caring

Nurses also should do psychological counseling for patients according to different psychological conditions and help patients establish confidence in recovery.

1. To spiritually support the patients but not insincere consoling. Sincere confidence in patients should be expressed to demonstrate that the patients are capable of overcoming the difficulties.
2. To provide patients an opportunity to relax themselves and help remove their negative emotions. Nurses should encourage and guide patients to express their emotions and feel-

ings out. When patients express their emotions, nurses should listen attentively in concerned, kind and sympathetic manner and express corresponding understanding.

3. It is important for patients to be hopeful for their recovery and optimism should be passed over to the patients. The understandings also should be expressed at appropriate time.
4. The patients should feel interested and concerned. Nurses should show that physicians give focused attention to them and desire to understand their thoughts. Care from their families and support from society should be told to the patients.

16.5 Nursing Care of Severely Ill Patients

Attendance of severely ill patients needs 24 h monitoring and caring by nurses. There are four major points in nursing care: (1) To ensure the unobstructed airway; (2) To monitor and support the respiratory functions; (3) To monitor patients' circulatory functions and give corresponding supports; (4) To safeguard the drug's use and follow physicians' orders timely and accurately with effective application of any drug the physician orders and observation of drug efficacy and adverse reactions. For traumatic operations and airway suction, nurses should pay particular attention to effective protection and reduce times of suction for severely ill patients. Closed suction catheter should be used. And negative pressure ward should be used for patients if necessary. If no negative pressure ward, the wards should be well ventilated.

16.5.1 Intensive Care

The patients' conditions should be closely observed and vital signs, especially temperature changes should be closely monitored. The key points include consciousness and difficulty breathing (rapid shallow breathing and three depressions sign). The case history of severe cases should be complete and accurate. The severe patients' conditions should be closely monitored and the key points of nursing care (oxygen therapy and life support) should be strictly observed. The conditions changes, managing process and managing outcomes should be recorded in detail. Various tubes and catheters should be observed.

16.5.2 Monitoring and Care of Respiratory System

The cause of death in patients with flu is commonly pneumonia, therefore, it is vitally important to monitor respiratory system. The important points in nursing care of respiratory

system include respiration rate, the warning signs of hypoxia, respiratory distress, cyanosis of lips. In physical examinations of the respiratory system, the key points include respiratory sounds, rales, parenchymal changes and pleural effusion caused by pneumonia. The key points for sputum test include the properties, color, quantity and evidence of bacterial infection. For severe cases, sputum leukocytes classification, gram staining and sputum bacteria culture should be ordered timely to determine secondary infection and its pathogen.

Critical pneumonia caused by primary viral infections or secondary bacterial infections, and deterioration of underlying diseases can result in ARDS and respiratory failure, which need oxygen therapy and mechanical ventilation. During oxygen therapy, mask inhalation is recommended because it ensures oxygen concentration and prevents coughed droplets. For slightly ill patients, non-invasive mechanical ventilation is recommended in the early period to relieve pulmonary edema, exudation and alveolar atelectasis as well as to reduce chances of pulmonary impairments and infections. Non-invasive ventilation refers to mechanical ventilation with positive airway pressure through nose mask or mouth and nose mask instead of through traumatic artificial airway. During SARS epidemic, these measures play important roles. And during Influenza A (H1N1) epidemic, the non-invasive ventilation also can be applied. For favorable ventilation, nursing care also plays an important role.

16.5.3 Nursing Care of Patients Using Non-invasive Ventilator

Non-invasive ventilator can be applied to patients who are sober, with favorable compliance and tolerance. The key points for nursing care are as the following:

1. For patients:

For patients who are initially receiving non-invasive ventilator therapy, unpleasant feelings may be occur because the mask covers the nasal cavity to cause breathing difficulty and anxiety. For such cases, psychological consoling should be well performed. Before the application of BiPAP for non-invasive ventilation, its benefits should be explained to the patients in detail. And the patients should know how to cooperate with the nurse, therefore relieve their anxiety. The patients should breathe peacefully and relaxed to induce facilitating breathing of BiPAP. Detailed and patient explanation may help patients and their family members to establish confidence.

For patients in consciousness with compliance, supine or sitting posture can be adopted. For patients with lethargy, lateral lying position, to avoid the falling of the tongue base. BiPAP ventilator does not require the establishment of artificial airway but achieves ventilation

through patients' respiratory tract. Therefore, the respiratory tract should be unobstructed.

2. Ensure an airtight ventilation circuit:

A nasal mask or a whole face mask with favorable airtightness should be selected. The nasal masks is appropriate for patients who are sober and can breathe with mouth shut. The whole face mask is appropriate for patients who need support of high pressure or breathe with mouth. The nylon headband should be fixed on the face closely; the position of the mask and the tightness of the nylon headband should be adjusted to avoid leakage. The gas pipelines should be tightly connected with each other and the alarming system set to ensure normal functioning of the ventilator.

3. During ventilation, the patients' blood gas, SpO₂, consciousness and breathing conditions should be closely monitored to ensure enough oxygen and oxygenation. The airway should be ensured unobstructed. Nurses should often turn patients over, slap patients' back and encourage them to cough for elimination of sputum. The airway should be unobstructed. The nose and mouth should not be directed to the medical staffs to avoid infection.

4. Psychological support should be provided to relieve patients' anxiety. Because most patients with Influenza A (H1N1) are seriously ill and quarantined, patients are susceptible to negative emotions. In addition, maladaptation to face masks render them claustrophobic and anxious. Therefore, the nurses should care and console patients and provide psychological supports including accompanying and directing. The sense of safety would ensure favorable synchronization between the patients' breathing and the ventilator.

5. Nursing care of complications:

During the treatment of BiPAP, nurses should observe closely the underlying critical complications, including microaspiration, cardiopulmonary complications, and changes in consciousness caused by hypoventilation. When the whole face mask is used, nurses should pay particular attention to the risk of microaspiration. The patient's facial expressions, SpO₂, and blood pressure should be closely observed. During non-invasive treatment, oral feeding should be possibly avoided. Food intake may be at 1 h before the non-invasive treatment. For patients receiving inhale positive airway pressure (IPAP) or exhale positive airway pressure (EPAP), nurses should observe the change in hemodynamic index. If intolerance of the whole face mask, deterioration of conditions, decreased consciousness, respiratory distress, cyanosis occur in patients, non-invasive ventilation must be immediately stopped and replaced by traumatic ventilation through endotracheal intubation.

6. The physical unpleasant feelings caused by non-invasive ventilation should be possibly reduced. The key points include nasal friction pressure, irritative keratitis, gastroin-

testinal distention, dry mucous membranes. The nursing care measures include adjusting the size and tightness of the face mask; applying triangular foam pad in the places where masks touch skin or a piece of foil on patients. Nurses should always observe skin redness or impairments at the nose bridge and on both nasal alar. The position of the face mask should be adjusted if necessary. The key to prevent irritation from keratitis is to prevent air leakage at the root of nasal bridge when non-invasive ventilation is applied. If keratitis does occur, antibiotic eye drops can be used. Gastrointestinal distention generally can be treated by gastrointestinal decompression. More nurses are needed for management of non-invasive ventilation.

16.5.4 Nursing Care of Patients Using Traumatic Ventilation

For cases of intolerance to non-invasive ventilation, deterioration of conditions, or ineffective non-invasive ventilation, invasive ventilation should be applied through tracheal intubation. The key points of nursing care include:

1. Basic care: The wards should be naturally ventilated. And the negative pressure rooms should be preferably used. Appropriate gargle should be selected based on the patients' conditions of patients. The oral cavity care should be ensured twice daily. Urine catheters, skin and overturning of the patients' bodies should all be managed to prevent pressure sores. The non-negative pressure wards should be ensured good ventilation.
2. Management of artificial airway. The first job is to assess the safety of endotracheal intubation (ETT), which is the lifeline of patients. For each shift, the nurses on duty should check the depth of intubation tube and the depth of endotracheal intubation. For adults, oral intubation from incisors in (22 ± 2) cm; for children from oral lips $(12 \pm \text{age}/2)$ cm. The localization of intubation should be observed at any time by observing synchronic arising and descending of the bilateral chest cavities, by auscultating or by chest X-ray.

Management of balloon: The balloon pressure of 20–25 cmH₂O should be examined on each shift. MOV can be applied to inflate balloon and routine ballonet deflation is not required.

Airway humidification: the airway temperature should be maintained at 320–370 °C. And airway humidification should be maintained at 100 %. For short term treatment, HME can be used, while for long term using a thermostat humidifier is recommended with a humidified volume of more than 250 mL daily.

Airway purification: The job is sputum suction in principles of sterility. The negative pressure depends on viscosity of sputum, generally at 0.02–0.04 MPa. Before

suction, high-concentration oxygen should be given and the suction should be performed in a gentle way within 15 s. No negative pressure is permitted into ETT. Oxygen saturation must be closely observed and the intubation must be stopped immediately at the oxygen saturation level of below 90 %. For pregnant women, SpO₂ should be above 95 %. For patients with severe Influenza A (H1N1), SpO₂ fastly declines, PEEP value is high when they receive mechanical ventilation. Suction perhaps causes interrupted ventilation and PEEP can also result in a fast decline in oxygen saturation. Therefore, the suction should be finished within a short period of time and avoid all openings directed to the medical staffs. In addition, for such cases, closed suction pipe is recommended to guarantee non-interrupted ventilation and to prevent infection of medical staffs by droplets and aerosols from the patients.

3. The range for alarming should be set to ensure the safety of patients receiving mechanical ventilation. During treatment, ventilator caused lung impairments should be avoided. For patients with ARDS, the protective ventilation measures can be implemented, with low tidal volume ventilation, high PEEP. If necessary, lung recruitment and prone position ventilation can also be applied. During their application, the nurses should check the change in airway pressure. In addition, VAP should be prevented with following procedures: the patients with no contraindications in semi-recumbent position; bed up about 30°–45° raised; clear away reserves of the balloon to prevent reflux; sterile suction techniques adopted; condensate water in the tubes of ventilator disposed to prevent their reflux into the airway; effective airway humidification; wake-up experiment daily to assess patients' spontaneous breathing; extubation as early as possible, or traumatic and non-invasive sequential therapies.

In respiratory supports, for severe and critical patients, extracorporeal membrane oxygenation techniques can also be applied to save the lives and to increase the survival chance.

16.5.5 Monitoring and Care of Circulatory System

Circulatory system failure sometimes occurs in patients with severe Influenza A (H1N1). So they should receive reinforced monitoring and caring. Medical staffs should observe and assess the patients' central venous pressure. If necessary, placement of the floating catheter or application of pulse indicator continuous cardiac output (PICCO) measurement can be applied to monitor hemodynamic index. During assessment of peripheral circulation and perfusion, the key points for nursing include warm peripheral extremities, the capillary filling time being less than 2 s, urination being more

that 0.5 mL/(kg.h.). The venous access should be kept open. Fluids and vasopressors should be administered to patients according to the physicians' order. Occurrence of complicated shock should be managed with anti-shock treatment. The balance of input and output should be maintained to avoid deterioration of pulmonary edema.

16.5.6 Monitoring Other Organs Functions

Renal functions: The monitored indices of renal functions include creatinine, urea nitrogen, urinary protein, clearance rate of metabolic waste, urination per hour. Continuous renal replacement therapy (a therapy for acute renal failure) is recommended when dramatic deterioration of renal functions occurs. For the cases with other organs impairments, related supportive therapies can be administered. Water and electrolytes balances should be maintained. According to studies, hypokalemia commonly occurs in severe cases of Influenza A (H1N1), with no known causes. Perhaps it is related to antiviral drugs. Therefore, it is necessary to examine potassium levels and supplement potassium timely in correct ways. Arrhythmia caused by potassium supplements should also be monitored, prevented or treated.

In addition, the protection of patients and medical staffs should be strengthened during the nursing care for severe and critical cases of Influenza A (H1N1). One ward should in place one patient or one group of patients with similar symptoms. The distance between beds should be more than 1 m. The ward should be naturally ventilated. The way of wearing surgical mask should be correct, with the external smooth surface and favorable tightness. The mask should be changed every 4 h or when being wet. To prevent spreading of Influenza A (H1N1) virus via aerosol, experts recommend medical staffs to wear N95 masks and goggles when performing endotracheal intubation, tracheoscopy or suction. Hands hygiene norms should be strictly implemented, including washing hands or instantly disinfecting hands before and after operations. Quarantine clothing should worn if necessary. Disposable closed suction catheter should be used for sputum suction. Filter should be installed at the exhaling openings of ventilator and the outlet should be placed at well ventilated area to reduce viruses contamination. Nurses should be divided into groups, with specific groups for nursing care of Influenza A (H1N1) patients to reduce cross personnels flow. Visits should be restricted. Terminal disinfection should be well performed according

to management rules of infections after patients are discharged from the hospital, including ward air and surfaces.

16.6 Nursing Care of Terminally Ill Patients

Nurses should apply various knowledge and skills to attend terminally ill patients both physically and psychologically. Psychologically, nurses should be aware of the attitude of these patients facing death and give appropriate supports. Physically, nurses should be able to differentiate terminally ill from death, and provide appropriate nursing care to minimize the suffering of terminally ill patients. The goal of nursing care for terminally ill patients is to make them go through the last stage of life peacefully and comfortably.

16.6.1 Life Care of Terminally Ill Patients to Make Them Feel Comfortable

1. To create a warm, quiet, comfortable and clean environment for patients while paying attention to the greening and beautification of the ward.
2. To well clean the patients, including cleaning of mouth, hair, skin, urine and feces, regular overturning to prevent pressure sores, beds cleaning, and timely clearing away of the vomited and excreted.
3. To provide diet care, including understanding the patients' eating habits; meeting the dietary requirements of the patients; paying attention to color, smell, taste of the food; keeping meals small and trying to increase patients' appetite; feeding food or providing parenteral nutrition when intake by mouth is impossible.

16.6.2 To Relieve the Physical Symptoms of Terminally Ill Patients

16.6.3 Pain Control and Pain Relief

1. To observe the nature, location, extent and duration of the pain.
2. To assist patients to select the most effective way to alleviate the pain. The commonly used pain relief methods are drug pain relief and non-drug pain relief.
3. The nurses should be sympathetic to patients, comforting, encouraging and communicating with them to stabilize their emotions, distract their attention from the illness and alleviate the pain.