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The Application of Milestone and Entrustable Professional Activity in Clinical Procedural Skills Training - the Two Years Reports



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The Application of Milestone and Entrustable Professional Activity in Clinical Procedural Skills Training – the Two Years Reports

- **Background**
- **Method**
- **Results**
- **Recommendations**

Keywords: Clinical Procedural Skills, Milestone, Entrustable Professional Activity

Background

- **Clinical Skills** is one of the Minimum 7 Essential Core Competences of the Institute for International Medical Education (IIME) Core Committee.
- In recent years, **Milestone** and **Entrustable Professional Activity (EPA)** were applied in postgraduate medical education training programs at the United States and Canada.
- The **clinical skills training** is also the ability in patient care, one of the six core competencies.
- The undergraduate year (**UGY**) training or postgraduate years (**PGY**) training had the clinical skills training in the division of clinical skills training or in the ward.
- The Objective Structured Clinical Examination (**OSCE**), and Direct Observation of Procedural Skills (**DOPS**) were used to do the assessment in clinical skills.
- The application of milestones and EPA in procedural skills training was **the first attempt** in UGY and PGY training programs in Taiwan.

Method

- During January ~ March 2017, we invited 5 clinical teachers to form a "[Clinical Skills Training Milestone and EPA Working Group](#)".
- They listed the EPA and Milestones of [6 procedure skills](#), include male urinary catheterization, blood sampling and blood culture, wound dressing, intravenous catheterization, wearing isolated gowns and insertion central venous catheterization.
- In April 2017, we invited another 5 clinical teachers to [validate the content of EPA and milestones](#) of the 6 procedure skills.
- Then, we conducted [a pilot test](#) and [1-year- follow up study](#) based on the EPA and milestones of the clinical skills for UGY/PGY trainees during Jun 2017 and Aug 2019.
- Finally, we collected [the questionnaires from UGY/PGY trainees](#) about the application of Milestone and EPA in Clinical Skills Training.

The EPA and Milestones of 6 procedure skills in Chinese

EPA: 核心能力
-病人照護-

Subcompetency: (1) 男性尿管置入術
學員曾經操作次數: 1-3 次 4-6 次 7-9 次 10 次以上

學員姓名: _____

關鍵缺失	僅能在旁觀察	指導者指導之下進行	可以獨立作業	可以指導其他學員				
<input type="checkbox"/> 不了解解剖構造 <input type="checkbox"/> 不了解無菌技術	里程碑 1: <input type="checkbox"/> 能描述男性泌尿系統解剖構造 <input type="checkbox"/> 了解無菌技術必要性 <input type="checkbox"/> 了解本技術所需器械	里程碑 2: (床邊指導) <input type="checkbox"/> 能成功執行尿管置入(含無菌技術)(假組) 里程碑 3: (需要時呼叫) <input type="checkbox"/> 能成功執行尿管置入(病人) <input type="checkbox"/> 了解無法置入時的 back up	里程碑 4: <input type="checkbox"/> 能獨立完成困難尿管置入	里程碑 5: <input type="checkbox"/> 能指導醫療人員放置尿管 <input type="checkbox"/> 能處理尿管置入之併發症				
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
臨床老師建議:								
評估者簽名: _____ 日期: _____ 年 _____ 月 _____ 日								

EPA: 核心能力
-病人照護-

Subcompetency: (2) 抽血及血液細菌培養
學員曾經操作次數: 1-3 次 4-6 次 7-9 次 10 次以上

學員姓名: _____

關鍵缺失	僅能在旁觀察	指導者指導之下進行	可以獨立作業	可以指導其他學員				
<input type="checkbox"/> 無菌消毒不確實 <input type="checkbox"/> 不懂何時求助 <input type="checkbox"/> 不了解禁忌症(如 AV. shunt)	里程碑 1: <input type="checkbox"/> 先了解解剖構造 <input type="checkbox"/> 抽血適應症、禁忌病及可能的併發症及後果 <input type="checkbox"/> 了解本技術所需器械	里程碑 2: (床邊指導) <input type="checkbox"/> 在醫師指導下,可成功執行抽血及無菌技術 里程碑 3: (需要時呼叫) <input type="checkbox"/> 可自行完成抽血及無菌技術 <input type="checkbox"/> 困難病患會隨時呼叫幫助,並使用超音波定位	里程碑 4: <input type="checkbox"/> 能成功執行 20 個案例以上 <input type="checkbox"/> 能在困難病患上成功執行抽血	里程碑 5: <input type="checkbox"/> 能教導建立血管通路技術 <input type="checkbox"/> 能教導建立無菌抽血技術 <input type="checkbox"/> 能教導血液培養瓶注入順序				
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
臨床老師建議:								
評估者簽名: _____ 日期: _____ 年 _____ 月 _____ 日								

EPA: 核心能力
-病人照護-

Subcompetency: (3) 傷口換藥
學員曾經操作次數: 1-3 次 4-6 次 7-9 次 10 次以上

學員姓名: _____

關鍵缺失	僅能在旁觀察	指導者指導之下進行	可以獨立作業	可以指導其他學員				
<input type="checkbox"/> 無菌技術不完整 <input type="checkbox"/> 傷口清洗不完整 <input type="checkbox"/> 使用敷料不正確	里程碑 1: <input type="checkbox"/> 能分辨: 紗布尺寸、Y 紗、彈繻、彈紗、紗繻、外用藥物	里程碑 2: (床邊指導) <input type="checkbox"/> 能執行無菌技術 <input type="checkbox"/> 能執行清洗傷口 <input type="checkbox"/> 能依換藥步驟執行 里程碑 3: (需要時呼叫) 能分辨傷口變化: <input type="checkbox"/> 傷口紅腫-評估 <input type="checkbox"/> 傷口流膿-I&D <input type="checkbox"/> 傷口太深-Wet Dressing	里程碑 4: <input type="checkbox"/> 能獨立完成傷口處理 <input type="checkbox"/> 能若傷口有變化,可決定何時須手術清創	里程碑 5: <input type="checkbox"/> 可執行傷口換藥教學及授課				
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
臨床老師建議:								
評估者簽名: _____ 日期: _____ 年 _____ 月 _____ 日								

EPA: 核心能力
-病人照護-

Subcompetency: (4) 靜脈注射
學員曾經操作次數: 1-3 次 4-6 次 7-9 次 10 次以上

學員姓名: _____

關鍵缺失	僅能在旁觀察	指導者指導之下進行	可以獨立作業	可以指導其他學員				
<input type="checkbox"/> 無菌操作技術不佳 <input type="checkbox"/> 靜脈解剖不清楚	里程碑 1: <input type="checkbox"/> 學習消毒步驟及適當靜脈之尋找	里程碑 2: (床邊指導) <input type="checkbox"/> 在指導下操作無菌步驟 <input type="checkbox"/> 尋找適當靜脈留置針 里程碑 3: (需要時呼叫) <input type="checkbox"/> 可以獨立完成,但困難血管仍需 call help	里程碑 4: <input type="checkbox"/> 每次均能獨立完成	里程碑 5: <input type="checkbox"/> 可以獨立完成並指導學習者改進				
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
臨床老師建議:								
評估者簽名: _____ 日期: _____ 年 _____ 月 _____ 日								

EPA: 核心能力
-病人照護-

Subcompetency: (5) 隔離衣穿戴
學員曾經操作次數: 1-3 次 4-6 次 7-9 次 10 次以上

學員姓名: _____

關鍵缺失	僅能在旁觀察	指導者指導之下進行	可以獨立作業	可以指導其他學員				
<input type="checkbox"/> 遺汗巾的隔離衣無適當處理	里程碑 1: <input type="checkbox"/> 先看錄影帶熟悉穿戴流程與場地配置	里程碑 2: (床邊指導) <input type="checkbox"/> 準備各項穿戴裝備 里程碑 3: (需要時呼叫) <input type="checkbox"/> 自行穿戴完畢後請指導者或協助者檢查	里程碑 4: <input type="checkbox"/> 可自行完成里程碑 2 和 3, 共 3 次以上	里程碑 5: <input type="checkbox"/> 完成里程碑 2、3、4 共 10 次以上 <input type="checkbox"/> 能協助指導其他人完成隔離衣穿戴				
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
臨床老師建議:								
評估者簽名: _____ 日期: _____ 年 _____ 月 _____ 日								

EPA: 核心能力
-病人照護-

Subcompetency: (6) 中央靜脈導管置入術
學員曾經操作次數: 1-3 次 4-6 次 7-9 次 10 次以上

學員姓名: _____

關鍵缺失	僅能在旁觀察	指導者指導之下進行	可以獨立作業	可以指導其他學員				
<input type="checkbox"/> 頭部主要血管解剖位置不明 <input type="checkbox"/> 無菌技術操作不良 <input type="checkbox"/> 對病人之說明解釋不清楚(模組操作可不評)	里程碑 1: <input type="checkbox"/> 明白頭部主要血管之解剖位置 <input type="checkbox"/> 明白 CVC 置入之操作步驟 <input type="checkbox"/> 可清楚說明治療目的及步驟	里程碑 2: (床邊指導) <input type="checkbox"/> 可順利完成擺位、清潔皮膚、消毒、鋪單 里程碑 3: (需要時呼叫) <input type="checkbox"/> 成功完成局部麻醉及頸靜脈探視 <input type="checkbox"/> 需要時能以血管超音波清楚定位血管方向	里程碑 4: <input type="checkbox"/> 可成功放置 CVC	里程碑 5: <input type="checkbox"/> 評估併發症(氣胸、動脈穿刺、局部血腫導致呼吸道阻塞) <input type="checkbox"/> 處理併發症(氣胸、動脈穿刺、局部血腫導致呼吸道阻塞)				
1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	4 <input type="checkbox"/>	5 <input type="checkbox"/>	6 <input type="checkbox"/>	7 <input type="checkbox"/>	8 <input type="checkbox"/>	9 <input type="checkbox"/>
臨床老師建議:								
評估者簽名: _____ 日期: _____ 年 _____ 月 _____ 日								

Results

- We had created the good **professional content validity** (1-5) in the EPAs and Milestones of 6 procedure skills, include male urinary catheterization (4.13), blood sampling and blood culture (4.09), wound dressing (4.12), intravenous catheterization (4.31), wearing isolated gowns (4.45) and insertion central venous catheterization (4.55).
- The pilot test and 1-year-follow up study (the final evaluation in 2018 & 2019) in UGY or PGY trainees showed the EPA's mean scores (1-9) : male urinary catheterization (6.7 / 8.6 / 8.2), blood sampling and blood culture (5.6 / 7.9/ 7.4), wound dressing (5.7 / 8.6 / 8.4), intravenous catheterization (6.0 / 7.4 / 6.6), wearing isolated gowns (5.0 / 8.2 / 7.0) and insertion central venous catheterization (6.0 / 7.0 / 7.0).
- Most of the participants' were positive feedback about the clinical skills training with milestones and EPA and 92.3% of them could get the predict training targets by themselves evaluation.

The professional content validity of 6 clinical procedure skills

	Professional content validity (1-5)
1. Male urinary catheterization	4.13
2. Blood sampling and blood culture	4.09
3. Wound dressing	4.12
4. Intravenous catheterization	4.31
5. Wearing isolated gowns	4.45
6. Insertion central venous catheterization	4.55

The results of 6 clinical procedure skills in pilot study in 2017

	EPA level Milestone(1-9)
1. Male urinary catheterization	L 4 (N=15/27) Mean 6.7
2. Blood sampling and blood culture	L 3-4 (N=17/30) Mean 5.6
3. Wound dressing	L 3-4 (N=11/30) Mean 5.7
4. Intravenous catheterization	L 3-4 (N=11/27) Mean 6.0
5. Wearing isolated gowns	L 3 (N=99/103) Mean 5.0
6. Insertion central venous catheterization	L 3-4 (N=35/87) Mean 6.0

The final evaluation of 6 clinical procedure skills in 2018 and 2019

	EPA level Milestone(1-9) in 2018	EPA level Milestone(1-9) in 2019
1. Male urinary catheterization	L 5 (N=17/27) Mean 8.6	L 4-5 (N=7/15) Mean 8.2
2. Blood sampling and blood culture	L 4-5 (N=24/26) Mean 7.9	L 4-5 (N=8/11) Mean 7.4
3. Wound dressing	L 5 (N=18/26) Mean 8.6	L 5 (N=8/14) Mean 8.4
4. Intravenous catheterization	L 4 (N=8/25) Mean 7.4	L 4 (N=5/12) Mean 6.6
5. Wearing isolated gowns	L 4-5 (N=4/5) Mean 8.2	L 4-5 (N=3/7) Mean 7.0
6. Insertion central venous catheterization	L 4-5 (N=3/6) Mean 7.0	L 4 (N=3/7) Mean 7.0

Fig 1. The milestones evaluation of 6 clinical procedural skills every 3 months since 2017.06

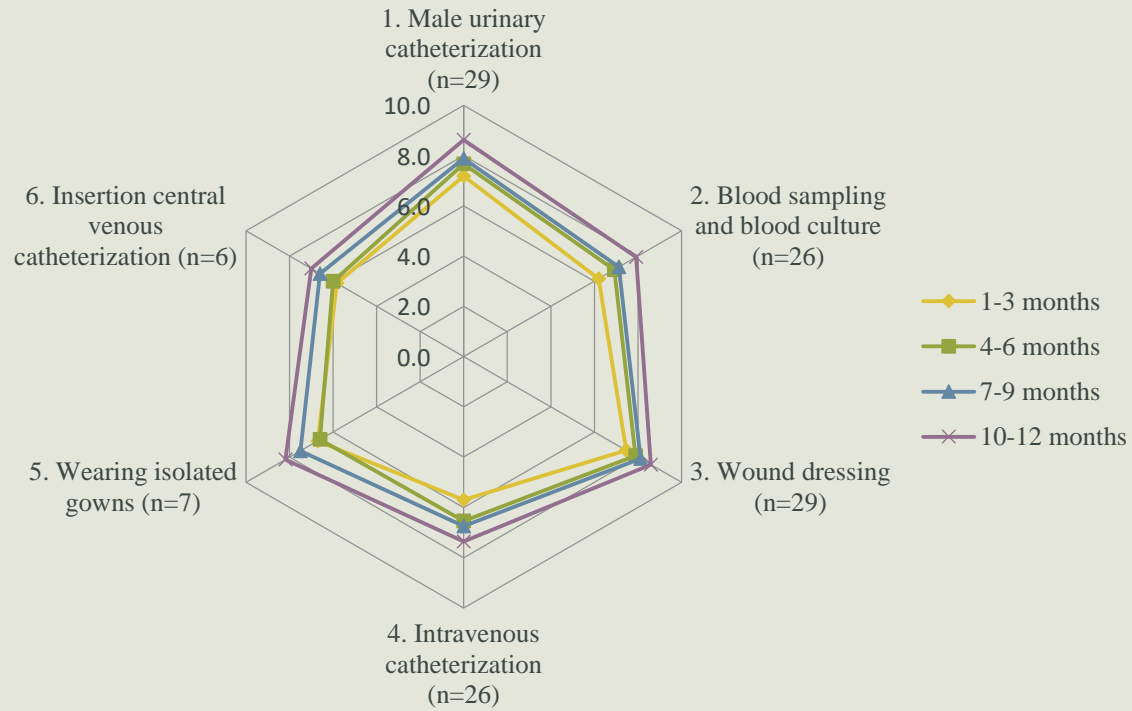
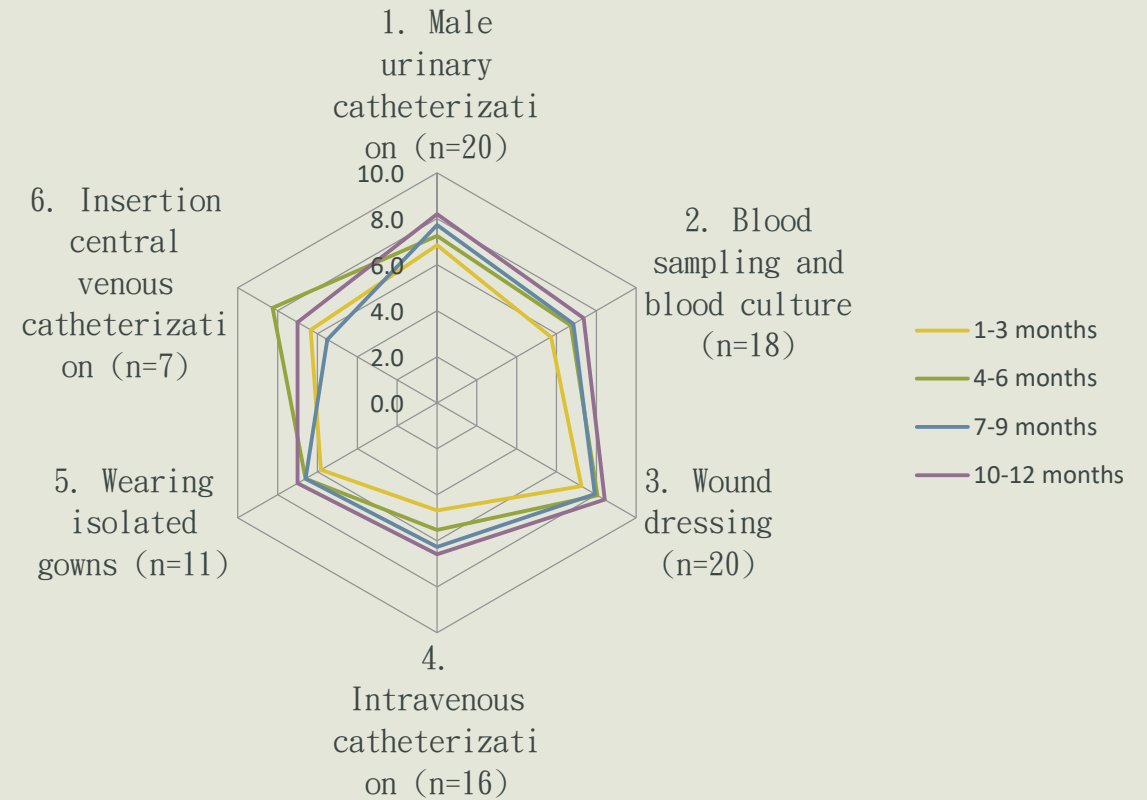


Fig 2. The milestones evaluation of 6 clinical procedural skills every 3 months since 2018.06



Recommendations

- 1. The application of Milestones and EPA in clinical procedural skills training need **good contents validity** and pilot tests, then the two years reports to **prove the effectiveness of the improvement** of clinical procedural skills in EPA level and milestone after 1 year follow up.
- 2. Most students had the **positive attitude and could get the predicted learning target** to face the application of Milestones and EPA in clinical procedural skills Training.
- The continue study of 2019/2020 UGY and PGY is on going till **2021/10/31**.

Thanks for your attention!