Effect of spontaneous pushing versus Valsalva pushing in the second stage of labour on mother and fetus: a systematic review of randomised trials

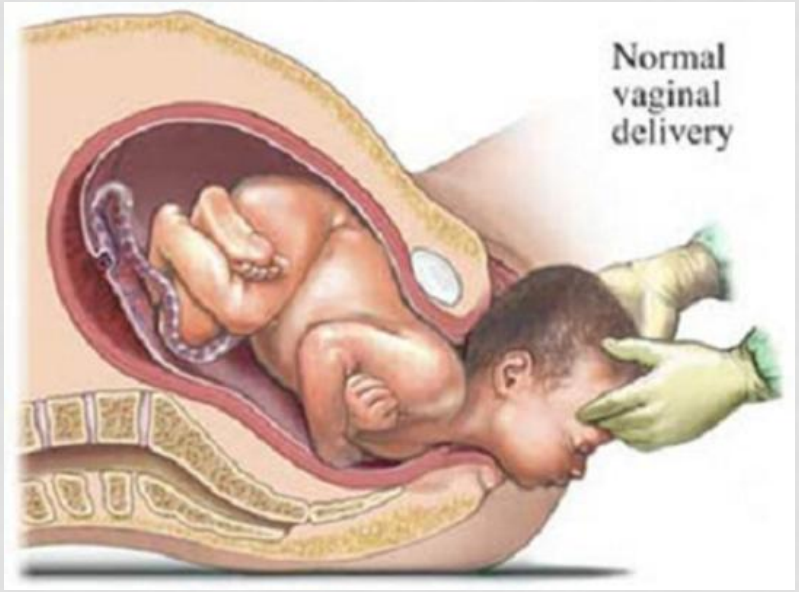
M Prins, J Boxem, C Lucas, E Hutton

BJOG. 2011 MAY;118(6):662-70. doi: 10.1111/j.1471-0528.2011.02910.X.
EPUB 2011 Mar 10.

引言人:斯莉婷　　日期:103.07.01

臨床現況

- 產婦於第二產程時開始閉氣用力，使胎頭下降至骨盆腔。
  - 方法-每次子宮收縮開始，深吸氣後憋氣(Valsalva pushing)，往下用力持續10秒，吐氣後再重覆一次
  - 可能產生的問題-
    - 臉紅脖子粗
    - 臉部微血管破裂
    - 骨盆底肌肉受傷
    - .....



Valsalva maneuver

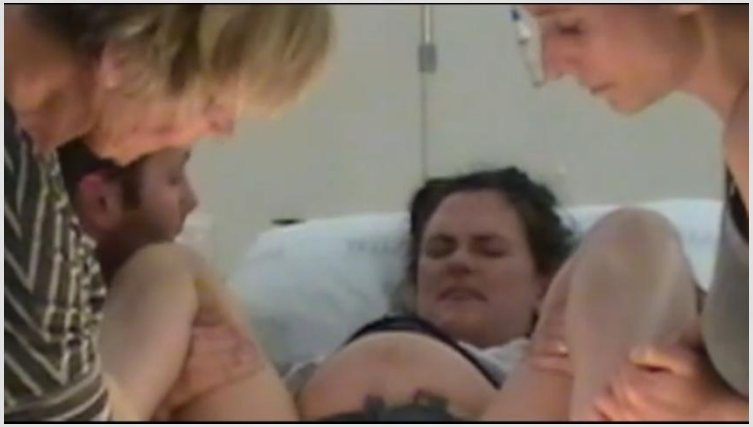
- 持續閉氣用力(Valsalva maneuver)是日常生活中常見的動作，例如：搬起或運送移動重物、解便用力、咳嗽、嘔吐、噴嚏...等等。深呼吸之後閉氣用力，這個動作會造成會厭軟骨關閉、胸腹腔內的壓力上昇、進而出現一系列心臟血管的血液動力變化，包括下列的各個時期：

時期	動作	心臟的血液輸出量	血壓	機制
I	用力初期	不變	上昇	胸腹壓力向周邊血管傳導
II	持續用力	下降	下降	靜脈回流減少
III	用力剛解除	下降	下降	血液會積蓄在肺部中
IV	恢復期	正常或上昇	正常或上昇	1.靜脈回流增加 2.副交感神經活性上升

參考資料http://www2.cch.org.tw/rcweb/view_Health.aspx?id=179

一定要閉氣用力嗎?

- Valsalva pushing vs. spontaneous pushing 對於母親及新生兒的利弊



Valsalva pushing

HTTPS://WWW.YOUTUBE.COM/WATCH?V=GMZWU6YRYC0

spontaneous pushing

https://www.youtube.com/watch?v=yreizEBmwHs

SELECTED ARTICLE

DOI: 10.1111/j.1471-0528.2011.02910.x
www.bjog.org

Systematic review

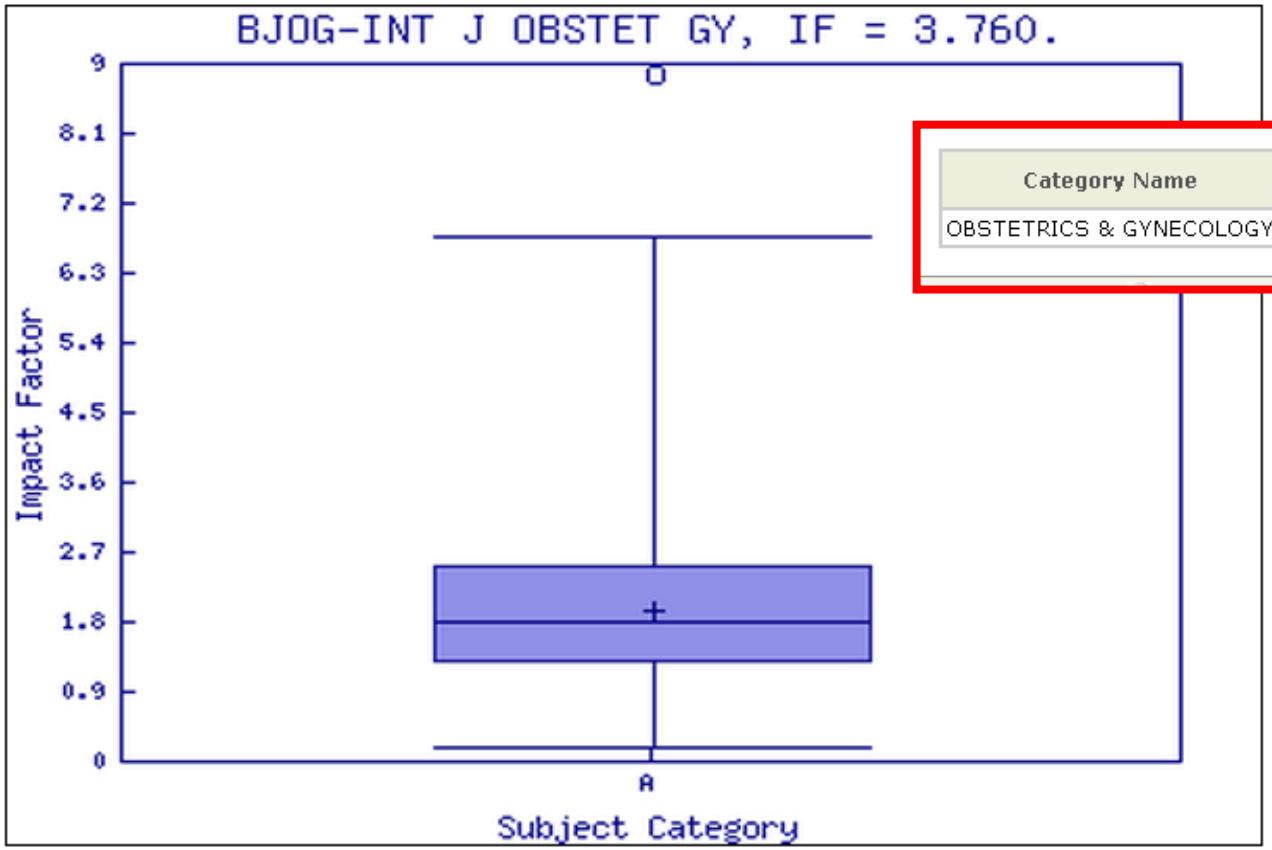
Effect of spontaneous pushing versus Valsalva pushing in the second stage of labour on mother and fetus: a systematic review of randomised trials

M Prins,[a] J Boxem,[a] C Lucas,[b] E Hutton[a,c]

[a] Department of Midwifery Science, AVAG and the EMGO Institute for Health and Care Research, VU University Medical Centre, Amsterdam [b] Department of Clinical Epidemiology, Biostatistics and Bioinformatics, Academic Medical Centre, University of Amsterdam, Amsterdam, the Netherlands [c] Department of Obstetrics and Gynaecology, McMaster University, Hamilton, ON, Canada
Correspondence: M. Prins, Midwifery Academy of Amsterdam and Groningen (AVAG), Louwesweg 6, 1066 EC Amsterdam, the Netherlands. Email marianne.prins@inholland.nl

Accepted 16 December 2010. Published Online 10 March 2011.

BJOG: AN INTERNATIONAL JOURNAL OF OBSTETRICS AND GYNAECOLOGY



Category Name	Total Journals in Category	Journal Rank in Category	Quartile in Category
OBSTETRICS & GYNECOLOGY	78	7	Q1

Key

A - OBSTETRICS & GYNECOLOGY

步驟 1：系統性文獻回顧探討的問題為何？

研究族群/問題	low-risk, healthy, nulliparous women with uncomplicated pregnancy 36 weeks
介入措施(Intervention)	spontaneous pushing
比較(Comparison)	Valsalva pushing
結果(Outcome)	**primary outcome** • Instrumental/operative delivery **Other outcomes** • Length of labour, Caesarean section, Episiotomy • Perineal/vaginal/anal sphincter laceration • Bladder function • Maternal satisfaction • Postpartum haemorrhage >1000ml **Infant outcomes** • Low Apgar score <7 after 5 minutes • Umbilical arterial pH <7.2, Need for intubation, • Admission to neonatal intensive care unit, • Serious neonatal morbidity

步驟 2：系統性文獻回顧的品質如何？ (FAITH)

F - 研究是否找到 (Find) 所有的相關證據？

最好的狀況是？
良好的文獻搜尋至少應包括二個主要的資料庫(如：Medline, Cochrane考科藍實證醫學資料庫, EMBASE 等)，並且加上文獻引用檢索(參考文獻中相關研究、Web of Science, Scopus或 Google Scholar)、試驗登錄資料等。文獻搜尋應不只限於英文，並且應同時使用 MeSH字串及一般檢索詞彙 (text words)。

- Included published and unpublished randomised controlled trials. We had no language restriction.
- Search in the Cochrane library, MEDLINE (1950 to May 2010), EMBASE (1980 to May 2010) and CINAHL (1982 to May 2010). We searched the registers of ongoing clinical trials, and performed an internet hand search to find relevant master's theses and dissertations. We cross-checked the reference lists of all relevant papers.
- The search terms included Mesh headings and key words linked with Booleans OR, AND.

評讀結果：■是　□否　□不清楚

步驟 2：系統性文獻回顧的品質如何？ (FAITH)

A - 文獻是否經過嚴格評讀 (Appraisal)？

最好的狀況是？ 應根據不同臨床問題的文章類型，選擇適合的評讀工具，並說明每篇研究的品質(如針對治療型的臨床問題，選用隨機分配、盲法、及完整追蹤的研究類型)

- **Quality was assessed** for randomisation (sequence, blinding), loss to follow up, number of participants, description of intervention treatment and control treatment, outcome variables, blinding of outcome measurements, intention-to-treat analysis and blinding of analysis.
- Two reviewers independently assessed the eligibility of the randomised controlled trials for inclusion; any disagreement of assessment was discussed and resolved by consensus.

評讀結果：■是　□否　□不清楚

步驟 2：系統性文獻回顧的品質如何？ (FAITH)

I - 是否只納入 (included) 具良好效度的文章？

最好的狀況是？
僅進行文獻判讀是不足夠，系統性文獻回顧只納入至少要有一項研究結果是極小偏誤的試驗。

The quality assessment data sheet is available on request.

評讀結果：　□是　□否　■不清楚

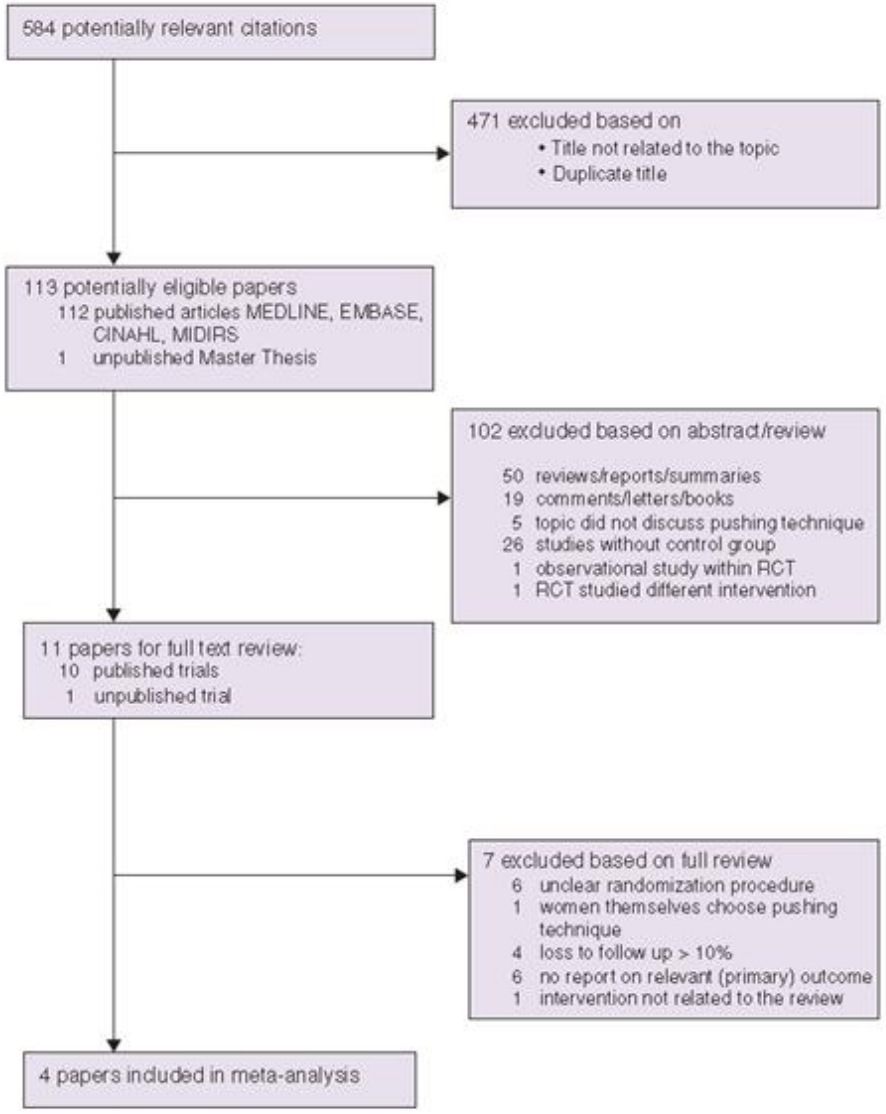


Figure 1. Results of literature review.

步驟 2：系統性文獻回顧的品質如何？ (FAITH)

T - 作者是否以表格和圖表「總結」 (total up) 試驗結果？

最好的狀況是？應該用至少 1 個摘要表格呈現所納入的試驗結果。若結果相近，可針對結果進行統合分析(meta-analysis)，並以「森林圖」(forest plot)呈現研究結果，最好再加上異質性分析。

3 studies, 425women
[RR] 0.70
95% CI 0.34–1.43

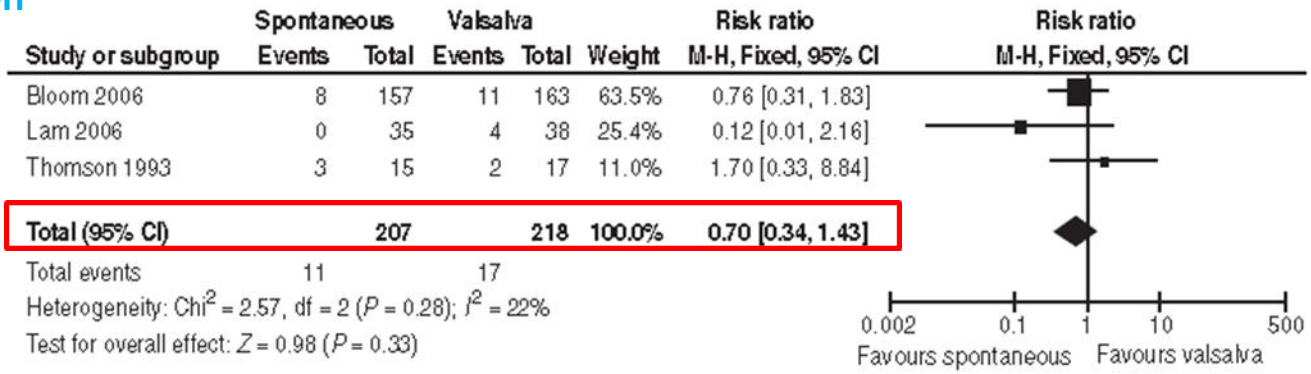
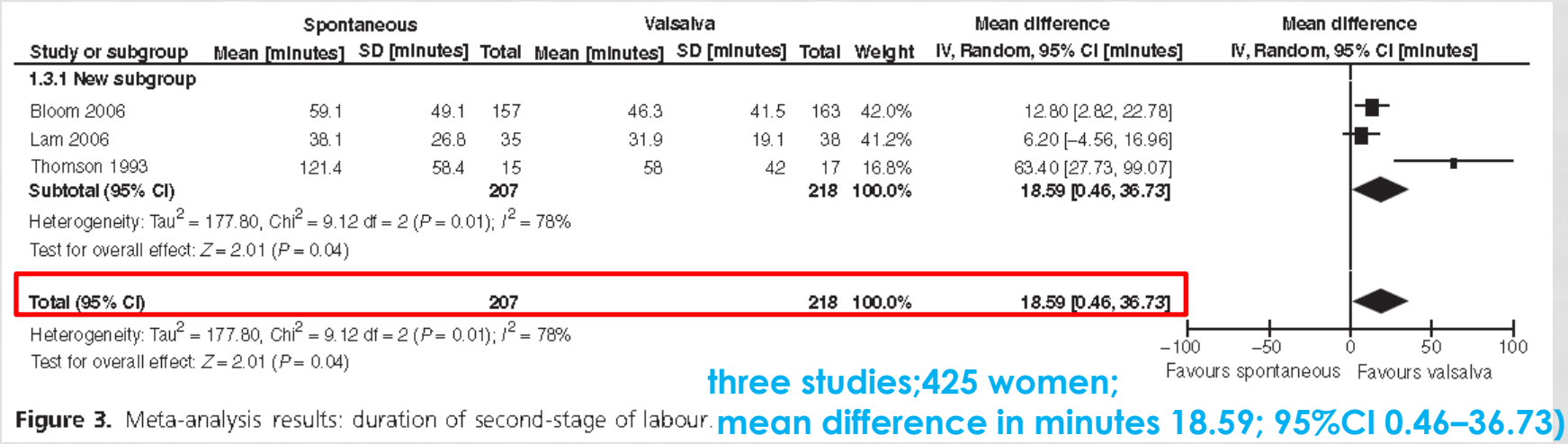


Figure 2. Meta-analysis results: instrumental/operative delivery.

no significant difference in instrumental/operative deliveries

步驟 2：系統性文獻回顧的品質如何？(FAITH)



Study or subgroup	Spontaneous Mean [minutes]	SD [minutes]	Total	Valsalva Mean [minutes]	SD [minutes]	Total	Weight	Mean difference IV, Random, 95% CI [minutes]
1.3.1 New subgroup								
Bloom 2006	59.1	49.1	157	46.3	41.5	163	42.0%	12.80 [2.82, 22.78]
Lam 2006	38.1	26.8	35	31.9	19.1	38	41.2%	6.20 [−4.56, 16.96]
Thomson 1993	121.4	58.4	15	58	42	17	16.8%	63.40 [27.73, 99.07]
Subtotal (95% CI)			**207**			**218**	**100.0%**	**18.59 [0.46, 36.73]**
Heterogeneity: $Tau^2 = 177.80$, $Chi^2 = 9.12$ df = 2 ($P = 0.01$); $I^2 = 78\%$								
Test for overall effect: $Z = 2.01$ ($P = 0.04$)								
Total (95% CI)			**207**			**218**	**100.0%**	**18.59 [0.46, 36.73]**
Heterogeneity: $Tau^2 = 177.80$, $Chi^2 = 9.12$ df = 2 ($P = 0.01$); $I^2 = 78\%$								
Test for overall effect: $Z = 2.01$ ($P = 0.04$)								

three studies;425 women;
mean difference in minutes 18.59; 95%CI 0.46–36.73)

Figure 3. Meta-analysis results: duration of second-stage of labour.

- Because the I^2 was 78% a sensitivity analysis was carried out by consecutively removing the studies and rerunning the analysis.
- By excluding the study of Thomson the mean difference was 9.75 minutes; 95% CI 2.43–17.06

評讀結果：■是　□否　□不清楚

Table 1. Characteristics of the studies included comparing spontaneous pushing in the second stage of labour with the Valsalva pushing technique

Author, Study period, Country, Population	Criteria for inclusion/exclusion	Primary outcomes instrumental/ operative delivery		Other outcomes	Comments
		Intervention Spontaneous pushing	Control Valsalva pushing		
Thomson[3] 1993 UK *n* = 32	Inclusion primiparous women aged over 18 singleton pregnancy >37 weeks cephalic presentation absence of maternal or fetal condition that would affect the management of the second stage of labour Exclusion conception achieved *in vitro* baby was to be adopted use of epidural analgesia	12/15 normal delivery	15/17 normal delivery	No significant difference in perineal trauma rate estimated maternal blood loss umbilical venous blood gas levels fetal acid–base status Significantly longer second stage in the spontaneous pushing group.	Randomisation using a table with random numbers, women at least 6 cm dilated. Researcher who was present at the time of randomisation. Pushing started as soon as the second stage of labour was diagnosed. After 90 minutes of pushing the midwife could adopt whatever clinical management she thought would fit. Mean duration of second stage in spontaneous group was 121.4 minutes. Outcome data all complete. Intention-to-treat analysis.
Schaffer[21]* 2005 USA *n* = 128 Hispanic women	Inclusion nulliparous women singleton pregnancy 36–41 weeks cephalic presentation uncomplicated pregnancy cervical dilatation at least 4 cm Exclusion use of oxytocin use of epidural analgesia history of urinary/anal incontinence history of pelvic organ prolapse estimated fetal weight >4000 g any known complication of pregnancy			No significant difference in maximum urethral closure functional urethral length positive Valsalva leak point pressure maximum flow rate ml/sec detrusor pressure at peak flow detrusor overactivity urodynamic stress incontinence Significant difference decreased bladder capacity in Valsalva group decreased first urge to void in Valsalva group	Allocation to study group adequate, see Bloom's study. Three months postpartum women were invited to undergo urodynamic tests. 61 from the intervention and 67 from the control group participated Urogynaecology nurse practitioners measured outcomes and were blinded to obstetric management

Table 1. (*Continued*)

Author, Study period, Country, Population	Criteria for inclusion/exclusion	Primary outcomes instrumental/ operative delivery		Other outcomes	Comments
		Intervention Spontaneous pushing	Control Valsalva pushing		
Bloom[20]* 2006 USA *n* = 325 Hispanic women	Inclusion nulliparous women singleton pregnancy 36–41 weeks cephalic presentation uncomplicated pregnancy cervical dilatation at least 4 cm regular uterine contractions Exclusion use of oxytocin use of epidural analgesia estimated fetal weight >4000 g known complication of pregnancy history of urinary/anal incontinence history of pelvic organ prolapse	7/157 instrumental 1/157 caesarean section	6/163 instrumental 5/163 caesarean section	No significant difference in umbilical arterial pH Apgar score <7 Admission to neonatal intensive care unit perineal lacerations Significantly longer second stage in the spontaneous pushing group	Computer generated randomisation in blocks of ten women at the onset of the second stage Pushing started as soon as the second stage of labour was diagnosed. Data outcome 320/325 complete Intention-to-treat analysis
Lam[19] 2006 Hong Kong *n* = 78, Chinese women	Inclusion woman between 18 and 40 years experienced their first birth healthy singleton fetus ≥37 weeks cephalic presentation uncomplicated pregnancy Exclusion medical or obstetric complication which would affect the management of the second stage of labour use epidural analgesia	0/35 instrumental (0/35 caesarean section)	4/38 instrumental (0/38 caesarean section)	No significant difference in length of the second stage of labour umbilical arterial pH Apgar score <7 admission to neonatal intensive care unit perineal lacerations Significantly more instrumental deliveries in the Valsalva group	Block randomisation on balanced blocks of ten at the onset of the second stage After 60 minutes of pushing the woman was changed over to the clinical management policy of the unit Pushing started when the fetal head was at +1 level of the ischial spines Control group 3/41 incomplete forms. In the experimental group 2/37 incomplete forms Intention-to-treat analysis

*Bloom and Schaffer used the same data from the trial with 325 women but presented different variables. In the table and meta-analysis we counted these women once.

評讀結果：■是　□否　□不清楚

步驟 2：系統性文獻回顧的品質如何？FAITH)

Table 2. Summary of the meta-analysis of maternal and fetal outcomes

Outcome or subgroup	Studies	Participants	Statistical method*	Effect estimate	*P* value	Heterogeneity I^2 (%)
Operative or instrumental delivery	3	425	Risk Ratio (M-H, Fixed, 95% CI)	0.70 (0.34–1.43)	0.33	27
Duration of second stage defined from full dilatation (minutes)	3	425	Mean difference (IV, Random, 95% CI [minutes])	18.59 (0.46–36.73)	0.04	78
Episiotomy	1	320	Risk ratio (M-H, Fixed, 95% CI)	0.79 (0.53–1.19)	0.26	
pH arterial <7.20 mmol/l	1	320	Risk ratio (M-H, Fixed, 95% CI)	0.65 (0.22–1.94)	0.44	
Mean venous pH	1	32	Mean difference (IV, Fixed, 95% CI)	−0.05 (−0.12 to 0.02)	Not applicable	
Mean arterial pH	1	320	Mean difference (IV, Fixed, 95% CI)	0.00 (−0.22 to 0.22)	1.00	
Mean Apgar score after 5 minutes	1	73	Mean difference (IV, Fixed, 95% CI)	0.00 (−0.23 to 0.23)	1.00	
Apgar score <7 after 5 minutes	2	393	Risk ratio (M-H, Fixed, 95% CI)	0.35 (0.01–8.43)	0.51	Not applicable
Any perineal repair	2	352	Risk ratio (M-H, Random, 95% CI)	0.95 (0.64–1.40)	0.79	57
Third- or fourth-degree tear	1	320	Risk ratio (M-H, Fixed, 95% CI)	0.87 (0.45–1.66)	0.66	
Need for resuscitation	2	352	Risk ratio (M-H, Fixed, 95% CI)	0.83 (0.40–1.75)	0.63	0
Admission to neonatal intensive care unit	2	393	Risk ratio (M-H, Fixed, 95% CI)	1.08 (0.30–3.79)	0.91	0
Mean estimated blood loss	2	105	Mean difference (IV, Fixed, 95% CI)	9.72 (−37.84 to 57.29)	0.69	0
First urge to void	1	128	Mean difference (IV, Fixed, 95% CI)	41.50 (8.40–74.60)	0.01	
Bladder capacity	1	128	Mean difference (IV, Fixed, 95% CI)	54.60 (13.31–95.89)	0.010	

*IV, inverse variance; M-H, Mantel–Haenszel.

H - 試驗的結果是否相近 - 異質性 (Heterogeneity)？

最好的狀況是？ 在理想情況下，各個試驗的結果應相近或具同質性，若具有異質性，作者應評估差異是否顯著(卡方檢定)。根據每篇個別研究中不同的PICO及研究方法，探討造成異質性的原因。

I^2 was 57% one study; 320 women; RR 1.25, 95% CI 0.76–2.06

評讀結果：■是　□否　□不清楚

結論

- 不支持常規使用Valsalva pushing
  - 降低產後3個月的膀胱容量，可能對骨盆底功能有負面影響(Schaffer, 2005))
- Spontaneous pushing
  - 鼓勵產婦選擇適合自己的用力方法
  - 支持產婦自己的身體感受，隨著往下的壓力感，持續用力
  - 護理人員提供明確的用力指導和協助

討論(1)

- 臨床上曾試過spontaneous pushing ，但產婦用力的強度及效果不佳，產前就需要開始練習，很難短時間學會
- 生產後的解尿困難，與產程時間長、使用產鉗及吸引器生產、膀胱脹太久或會陰4度裂傷...等因素，可能會使膀胱神經鈍化，影響解尿功能，但本研究結果顯示，差異量不大

討論(2)

- 是否在第二產程時，建議產婦使用 Spontaneous pushing？

✓同意7人
✓懷疑11人
✓不同意1人

THANK YOU!