## Improving prediction of preterm birth

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Determining patients at greatest risk of preterm labour is a challenge:



### **70%**

of women presenting with symptoms of threatened preterm labour give birth at term<sup>1</sup>



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>95%

of women with symptoms of preterm labour don't deliver within 14 days of presentation<sup>2</sup>

- 1. Guinn DA, Goepfert AR, Owen J, Brumfield C, Hauth JC. Management options in women with preterm uterine contractions: a randomized clinical trial. *Am J Obstet Gynecol*. 1997;177(4):814-818. doi:10.1016/s0002-9378(97)70274-6
- 2. Peaceman AM, Andrews WW, Thorp JM, et al. Fetal fibronectin as a predictor of preterm birth in patients with symptoms: a multicenter trial. Am J Obstet Gynecol 1997;177:13-8

## First do no harm: risks of intervention



	Fetal	Maternal	Service
Steroids	HPA axis, neonatal hypoglycaemia <sup>1</sup> , Lower birthweight, increased risk of dying <sup>2</sup> , decreased brain growth <sup>3</sup>	Maternal glucose intolerance <sup>6</sup>	Admissions, Sliding Scales
In-utero transfer	Morbidity/mortality due to increased ex- utero transfers	Financial costs and emotional strain <sup>7</sup>	Administrative burden, bed/cot blockage
Tocolytics	COX-2 Closure of DA, renal complications <sup>4</sup>	CaCh blockers- headache, rash, nausea and mild tachycardia, hypotension <sup>8</sup>	Atosiban- infusion costs
Mag Sulphate	Spontaneous intestinal perforation <sup>5</sup>	Hypotension, tachycardia, resp depression	One-to-one care

1 Davis EP, Glynn LM, Waffarn F, Sandman CA. Prenatal maternal stress programs infant stress regulation. J Child Psychol Psychiatry. 2011;52(2):119-129. doi:10.1111/j.1469-7610.2010.02314.x

- 2 WHO (2015) WHO recommendations on interventions to improve preterm birth outcomes. Available at: https://apps.who.int/iris/bitstream/handle/10665/183037/9789241508988\_eng.pdf?sequence=1.
- 3 Roberts D, Brown J, Medley N, Dalziel SR. Antenatal corticosteroids for accelerating fetal lung maturation for women at risk of preterm birth. Cochrane Database Syst Rev. 2017;3(3):CD004454.
- 4 Norton ME, Merrill J, Cooper BA, Kuller JA, Clyman RI. Neonatal complications after the administration of indomethacin for preterm labor. N Engl J Med. 1993;329(22):1602-1607.
- 5 Rattray BN, Kraus DM, Drinker LR, Goldberg RN, Tanaka DT, Cotten CM. Antenatal magnesium sulfate and spontaneous intestinal perforation in infants less than 25 weeks gestation. J Perinatol. 2014;34(11):819-822.
- 6 Kalra S, Kalra B, Gupta Y. Glycemic management after antenatal corticosteroid therapy. N Am J Med Sci. 2014;6(2):71-76. doi:10.4103/1947-2714.127744

7 Porcellato, L. et al. (2015) "It's something you have to put up with" - Service users' experiences of in utero transfer: A qualitative study', BJOG: An International Journal of Obstetrics and Gynaecology, 122(13), pp. 1825–1832.

8 Caritis, S. (2005), Adverse effects of tocolytic therapy. BJOG: An International Journal of Obstetrics & Gynaecology, 112: 74-78.

9 Lu JF, Nightingale CH. Magnesium sulfate in eclampsia and pre-eclampsia: pharmacokinetic principles. Clin Pharmacokinet. 2000;38(4):305-314.

## Available tests for symptomatic women



- Transvaginal ultrasound cervical length (TVUS) measurement
- Biochemical markers
  - IGFBP-1 (Actim Partus)
  - PAMG-1 (PartoSure)
  - Fetal Fibronectin (fFN)





# The QUiPP App





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**Pioneering better** 

- Free to download on Apple and Android– search 'QUiPP'
- Website version available at: <u>www.quipp.org</u>
- Gives individualised scores for risk of having a spontaneous preterm delivery
- Uses medical history, her quantitative Fetal Fibronectin result and/or cervical length
- 3 separate algorithms [a) fFN only, b) cx length only, c) fFN and cx length combined]
- We use the actual concentration of fFN in the app (no cut off)
- Decision-support tool











You can use the QUIPP longer term predictions (e.g. risk of delivery within 2 weeks and 4 weeks) to determine when the woman should have her next antenatal appointment -and use QUIPP on her again if necessary!

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## How accurate is QUiPP at predicting PTB?





UOG Watson, Carter Seed et al. Development and validation of the predictive models for the QUiPP App v.2: a tool for predicting preterm birth in high-risk asymptomatic women, 2019

UOG Carter, Watson, Seed et al. Development and validation of prediction models for the QUiPP App v.2: a tool for predicting preterm birth in women with symptoms of threatened preterm labor 2019

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# 89% of hospital admissions avoided, and associated risks and costs



#### NICE 'treat all' Policy



#### QUIPP treat ONLY > 5% risk Policy

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Sent home appropriately
Sent home inappropriately
Hospitalised appropriately
Hospitalised inappropriately

Watson, H.A., Carter, J., Seed, P.T., Tribe, R.M. and Shennan, A.H. (2017), The QUIPP App: a safe alternative



to a treat-all strategy for threatened preterm labor. Ultrasound Obstet Gynecol, 50: 342-346.



## Thank you

# A more detailed presentation and information is available at: www.bapm.org/quipp



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