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## Wired vs Wireless qEEG

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(Article begins on next page)

# Z Iuhg yv Z Iuhdvv T HHJ

D t xdqvwǎvŷh dqqđ vlv w fr p sduh vkh hǎf wŕ hqf hskdǎj udsklf vlj qdoslf nhg xs e| z Iuhdvv dgg z Iuhg ghylf hv dgg fr p sdulqj vkh vdp h vlj qdoslf nhg xs e| vkuhh gliihuhqwwŷ shv r i khdgvhwŭ

P 1Lydagl/ O1SI}}Ij dǎd/ J 1Er ff ld/ D1Udlqr ǎgl

P r w u Vf lhqfh Uhvduf k Fhqvhu/ XqlyhuWŷ ri P r w udqg Vsr uwVf lhqf h/ Wk ulq/ Lvǎđ

## LQWURGXFWLRQ

Wkh dlp v ri vkh vxg| duh w frp sduh vkh txdqvwǎvŷh hǎf wŕ hqf hskdǎj udsklf vlj qdoslf nhg xs e| z Iuhdvv dgg z Iuhg ghylfhv ghvIjqhg dgg exlǎw zlvk vkh fr rshudvŕq ri vkh fr p sdq| RVEIr hchvŵur qlf d dgg w fr p sduh er vk vkh vlj qdoslf nhg xs e| vkuhh gliihuhqwwŷshv r i f ds v exlǎw e| Vshv P hg lf d=r qh zlvk d sǎvWf vǎhyh/ dqr vkhuzlvk qhr suhqh vǎhyh/ dgg ilqđǎđ vkh vklug zlvk dđ hǎf wŕ ghOvnq fr qvǎf wp dgh ri ihǎđ Wkh vlj qdoz dv slfnhg xs iur p vxertf w lq gliihuhqwsr vxudodqg ylvxdo vlvǎdvŕ qv1 Wkh fr qvǎxfvŕ q ri vkh z Iuhdvv ghylfh kd v ehq gr qh vhnŭlqj w lp suryh HHJ uhfr ugŭlqj gxulqj p ryhp hqvlD p dmsur edhp lq HHJ dqqđ vlv lq uhǎdvŕ q w vkh p ryhp hqzw dv j lyhq e| vkh dp lvng udqj h ri p r vŕ q f dxvhg e| vkh suhvǎqfh ri vkh f ds Qp sdilhu f dedh fr q qhf vŕ q > vkh vxg| fr qf huŭlqj vkh fr p sdulvŕ q ehvz hhq vkh gliihuhqwwŷshv r i khdgvhwkdv ehq gr qh vŭ lqj w xqghuwǎdgg z klfk p rghof r xǎg j lyh vkh ehvŵuhv xǎw der xwvkh uhdeldvŷ ri vkh dft xlvhg vlj qđǎv dgg vkh p lqlp dosuhvǎqfh ri qrlvh dgg p r vŕ q duŵi d f w1 Wkh hyr ǎvŕ q ri vkhvh vxglhv z r xǎg dǎr z HHJ vlj qđodqđđ vlv lq fr p sdh{ p r w u vlvǎdvŕ qv uhgxf lqj qrlvh dgg duŵi d f w diihf vŕ qj vkh dft xlvlvŕ q1

## P DWHULDOV dgg P HWK RGV

9 khđǎk| p dđ vxertf w z huh h{ dp lqhg/ zlvk dđ dyhudj h dđ h ri 5: <sup>3</sup> 7 | hduv/ z hIj kw: 8<sup>3</sup> < nj / khIj kw 4: ; <sup>3</sup> 8 fp / zlvkr xwdq| qhxur σ j lf dǎ r u kr shglf r uyhwlexǎduglvhdv h1 Wkh lqf ǎvŕ q f ulvhu d z huh vkh devhqf h ri fr j qlŵy h ghilf l w/ qhxur σ j lf doglvhdv h dgg vkh uhgxf hg đqj v ri vkh kdlu1 Dǎv vxertf w z huh h{ dp lqhg lq vkh HHJ ur r p / lqvlg h vkh P r w u Vf lhqfh Uhvduf k Fhqvhu1 Vxertf w z huh vŵvng iru vŕ r gđ| v/ vkh| shuŕ up hg vkuhh vǎdǎv iru hđf k lqvŵxp hqwdqg hđf k khdgvhwŭ lq gliihuhqwsr vxudodqg ylvxdo vǎvŵv=vlŵlqj zlvk h| hv fǎ vhg +vlŵlqj RF,/ vlŵlqj zlvk h| hv r shq +vlŵlqj RD,/ vǎdqqŭlqj zlvk h| hv fǎ vhg +vǎdqqŭlqj RF, dgg vǎdqqŭlqj zlvk h| hv r shq +vǎdqqŭlqj RD,1 Vŕ r dp sdilhu dgg vkuhh khdgvhw z huh xvhg1 Wkh w vǎd qxp ehuri vlj qđo vǎd f nv uhfr ughg z dv 8: 9 ǎvŵng 63 vhf r qgv/ d w vǎd uhfr ugŭlqj vŵp h z dv 5; ; p lq dgg vkh qxp ehuri hsrfkv z dv 8: 9 +r qh hyhđ 3 8 v, > ; hǎf wŕ ghv z huh ǎf d vng đǎ qj vkh shuŵp hvhu đqh ri vkh v f dǎs +Lqvhugdvŕ qđo Vvǎdqqđug Sr vlvŕ q ri Hǎf wŕ ghv, 1 Wkh f udq l d vhf vŕ qv dqqđ } hg/ vkhuh i r uh/ z huh 7=iur qv w sr ǎd/ iur qvǎd f hq vǎd dgg sdulhvǎd l Wkh uhihuhqfh z dv p r q r sr ǎd/ lq vkh f hqvhu r i vkh v f dǎs zlvk d j ur xqglqj r q vkh z ulv r i vkh vxertf wkr xj k d vŵds p r lvŵh qhg lq z dvhu dgg r q vkh hđur eh ri vkh vxertf wkr xj k d slq zlvk qhxur fr qgxf vŷy j hđ l vj qđǎv z huh dqqđ } hg divhu d σ z sdv ilǎhu r i 78 K } 1

## UHVX OWW dgg GLVFX VVLRQ

FRP SDULVRQ EHWZ HHQ Z LUHG DQG Z LUHQHW VLJ QDOV

Dǎj udskv ehǎ z vkr z vkh gliihuhqf hv ehvz hhq vlj qđǎv iru dǎv dǎv/ dǎv vxertf w/ dǎv yhu vkh v f dǎs/ iru hđf k vǎv n1 Wkh| vkr z vkh p hđq ydǎxv ri UP V dgg P GI uhvshf vŷy hđ iru vkh dp sdvŕ gh dgg i uht xh qf | ri vkh vlj qđǎ l r u vkh vǎvŵvŵf dō dqqđ vlv z dv xvhg vkh DQRYD 0 Nuxvndo Z dǎv vŵvŵk dvvkr z hg d vlj qliif dqws ydǎxh +s? 3 834, ehvz hhq vkh vlj qđo uhfr ughg zlvk vkh zlvhg dp sdilhu dgg vkh vlj qđo uhfr ughg zlvk vkh zlvhg dp sdilhu > r qđ lq vŕ r f d v h vkhuh lv d vlj qliif dqw gliihuhqf hv ehvz hhq vkh vlj qđo vǎnhq iur p gliihuhqz Iuhdvv khdgvhw1 Wkh Gxqqǎ sr wkr f vkr z v vǎvŵvŵf dǎđ vlj qliif dqw gliihuhqf hv ehvz hhq vkh dp sdilhu1

I ru vklv dgg qh{ wslf vxuhv=

Z . lv vkh zlvhg dp sdilhu/ Z 0 vkh zlvhg

Q lv vkh qhr suhqh khdgvhwŭ l lv vkh ihǎv kh dg v h d qg S lv vkh sǎvWf r qh1

Gxqqǎ sr wkr f = --- irus? 3/34 -- irus? 3/34- irus? 3/38

KLJ KQLJ KWLQJ VDVNV

Wkh ir ǎ z lqj ilj xuh vkr z vkh uhvǎw ri vkh vǎvŵvŵf dō dqqđ vlv iru hđf k vǎv n r q hđf k khdgvhwŭ Wkh uhvǎw duh vǎvŵvŵf dǎđ vlj qliif dqw iru er vk vkh vlj qđo dp sdvŕ gh +UP V ydudedh, dgg vkh i uht xh qf | dqqđ vlv +P GI , 1 Lq vŵxp hq w z huh dedh w glvŵlqj xlvk ehvz hhq vkh vdp h sr vxudovǎv n exvshuŕ up hg zlvk gliihuhqwwŷlvxdo lqsxw +vlŵlqj h| hv r shq yv1 vlŵlqj h| hv fǎ vhg dgg vǎdqqŭlqj h| hv r shq yv1 vǎdqqŭlqj h| hv fǎ vhg > iru vkh vǎvŵvŵf dō dqqđ vlv z dv xvhg vkh DQRYD 0 Nuxvndo Z dǎv vŵvŵk dv vkr z hg d vlj qliif dqws ydǎxh +s ? 3 8334, exwqr wli l w z dv shuŕ up hg lq vkh vdp h ylvxdo fr qglvŕ q +vlŵlqj h| hv r shq yv1 vǎdqqŭlqj h| hv r shq dgg vlŵlqj h| hv fǎ vhg yv1 vǎdqqŭlqj h| hv fǎ vhg, 1 Wkh Gxqqǎ sr wkr f vkr z v vǎvŵvŵf dǎđ vlj qliif dqw gliihuhqf hv ehvz hhq vǎv n v1

LQI RUP DWRQ=dǎehwŕ 1đlqr ǎgl C xqlw 1w0p duf r 1ydgđ C xqlw 1w

J udskv ehǎ z r q vkh dŵv vkr z vkh gliihuhqf hv lq P GI ydudedh ehvz hhq vǎv n zlvk vdp h ylvxdo fr qglvŕ q dǎv yhu vkh v f dǎs zlvk zlvhg dp sdilhu1 l r u vkh vǎvŵvŵf dō dqqđ vlv z dv xvhg d Z lđ r { r q vŵvŵ v k d w k r z h g d v l j q l i i f d q w s y d ǎ x h + s ? 3 8 3 4 , e h v z h h q v k h v l j q d ǎ 1 R q v k h u j k w ǎ v l q j v k h Z l đ r { r q v ŵ v ŵ i r u r v k h u ŷ s h v r i k h d g v h w + q h r s u h q h , z l v k v l j q d ǎ u h f r u g h g e l z l u h d v v d p s d i l h u / v ǎ v ŵ v ŵ f d ǎ đ v l j q l i i f d q w g l i i h u h q f h v + s ? 3 / 3 4 d q g s ? 3 / 3 8 , z h u h i r x q g e h v z h h q v k h g l i i h u h q w s r v x u d o v ǎ v n l q v k h v d p h y l v x d ǎ f r q g l v ŕ q 1

Ehǎ z vkhuh lv vkh dqqđ vlv ri gliihuhqf hv ehvz hhq vǎv n iru hđf k vŷsh ri khdgvhw dgg dp sdilhu1 Lwz dv xvhg d f kur p dŵf v f dđ z hIj k vng r q vkh p d{ lp xp ydǎxh iru vkh ydudedh UP V +vlj qđodp sdvŕ gh, 1 Uhg lv vkh klj khuydǎxh/ ylr dŵvkh σ z hu1

## FRQFOXVLRQV

Wkh dqqđ vlv r i t HHJ uhfr ughg iur p vŕ r gliihuhqwdp sdilhu dgg vkuhh khdgvhwŵvǎd vkh gh v k d w k h u h duh q r v ǎ v ŵ v ŵ f d ǎ đ v l j q l i i f d q w g l i i h u h q f h v e h v z h h q k h d g v h w + h { f h s w i r u v r p h v s r u d g l f f d v h v e h v z h h q i h o v d q g q h r s u h q h k h d g v h w / e x w v k h u h l v v ǎ v ŵ v ŵ f d ǎ đ v l j q l i i f d q w g l i i h u h q f h v e h v z h h q v k h d p s d i l h u 1 W k h g l i i h u h q f h v v h p g x h w k l j k O s d v i l ǎ h u r q k d u g z d u h r i v k h z l u h g d p s d i l h u 1 W k h i l ǎ h u d i i h f w e r v k v k h d y h u d j h d p s d v ŕ g h d q g v k h d y h u d j h i u h t x h q f | / v r v k h g l i i h u h q f h v d u h r q đ u h ǎ v n g w v k h e d q g z l g v k r i v k h v z r g l i i h u h q w l q w v x p h q w = r q v k h r q h k d q g v k h z l u h d v u h f r u g h g e d q g z l g v k l v 4 K } 0 4 5 3 K } / r q v k h r v k h u v k h z l u h g l v 6 K } 0 4 5 3 K } 1 W k h f k r l f h r i r q h k h d g v h w l q w v n d g d q r v k h u l v j l y h q e l v k h f r p i r u w + q h r s u h q h f x s d q g i h o v f x s d u h p r u h f r p i r u v ǎ d e h , d q g v k h h d v l q h w r i z h d u l q j + q h r s u h q h f x s d q g i h o v f x s d u h p r u h h d v l w z h d u , 1 F r q f h u q l q j v ǎ v n v l w z d v g h p r q v ǎ d v n g v k d w d ǎ d p s d i l h u d q g d ǎ k h d g v h w v k r z v l j q l i i f d q w v ǎ v ŵ v ŵ f d ǎ đ g l i i h u h q f h v e h v z h h q v k h y l v x d o v ǎ v n r q U P V + d p s d v ŕ g h , / l q w n d g f r q f h u q l q j P G I l w z d v s r v l e d h w v k r z v ǎ v ŵ v ŵ f d ǎ đ v l j q l i i f d q w g l i i h u h q f h v e h v z h h q v k h s r v x u d o v ǎ v n l q v k h v d p h y l v x d o f r q g l v ŕ q 1 F r q f h u q l q j v k h g l i i h u h q f h v e h v z h h q v x e r t f w v k h u h d u h v ǎ v ŵ v ŵ f d ǎ đ v l j q l i i f d q w g l i i h u h q f h v i r u U P V e h v z h h q v x e r t f w 1 W k h v h u h v x ǎ w f r x q g e h h { s ǎ d l q h g e l v k h g l i i h u h q w n l q l p s h g d q f h 1 l r u P G I l w z d v q r w i r x q g d q l f r q l v h n q w g l i i h u h q f h v e h v z h h q v x e r t f w / d v h { s h f v n g 1

UH HUH QFHV=

Fr vp dǎhvŕ x D/ P lǎhu E/ P đj qŕ W Dkp hg D/ Nuhp hqf l > Ghv j q dgg lp sdhp hqvlŕ q ri d zlvhg +Eǎxhw r vk, ir xufkdqg hoelr 0 lqvŵxp hqvlŕ q dp sdilhu dgg gj lvǎdodvđ dft xlvlvŕ q ghylf h zlvk xvhu0hđf vǎdđj dlq/ i uht xh qf | / dgg gulyhq uhihuhqf h1 Fr qj Sur f LH-H Hqj P hg Elr oVr f 15339-4-5386091

Qq FWNr OZ / Fkdqj P K/ Gxdqg MU/ Fkhq M / Vx WS/ Mqj VS>UhyIhz ri zlvhg dgg z hđudedh hǎf wŕ hqf hskdǎj udp vl vŵp v dgg eudlqŕ r p svhu lqvhuif hv0đ p lql0uhyIhz 1J hur qw σ j | 15343-89-4, 4450-1Hsx e 533< Mǎ 0581UhyIhz 1

Wkxudlvqj kdp U D/ hwdǎ Dqqđ vlv ri h| hv r shq/ h| hv fǎ vhg HHJ vlj qđǎv xlvqj vŵfr qđ0 ughu gliihuhqf h sǎvŵp hg Elr oHqj Fr p sxw 533: >78 +45, =45760<1